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CANADA

DATA RECORD  
**HUDSON BAY PROJECT — 1961**

*6690*  
**No.1 - 5**

**1964 Data Record Series**

*1964 1-5*

**Canadian Oceanographic Data Centre**

**Programmed by the  
Canadian Committee on Oceanography**

**1964**



GC  
1  
C35  
1964  
no. 1-5



1025198

ROGER DUHAMEL, F. R. S. C.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1963

Cat. No. M58-1/1964-1



## ERRATA

To publication No. 1 in the 1964 Data Record Series

HUDSON BAY PROJECT - 1961

- (1) Figure 5. A station indicated in about position  
60°30'N, 84°00'W. is an error.
- (2) Page 15. The name "van Deen" should read  
"van Veen".
- (3) Page 15. The plankton net should have been  
described as a Hensen net with an  
opening of 70 cms.
- (4) Page 147. The tabulated temperature at 30m at  
station 217 should read -1.34.





## ERRATA

TO



Publication No. 5, 1964 Data Record Series  
P.O.G. Cruise: P-63-4  
Ocean Weather Station "P" North Pacific Ocean  
September 11 - October 25, 1963.

Second flyleaf: First name following "Observers"  
is spelled incorrectly, should  
read: Mr. J.A. Stickland.

Page 14 Second line of chapter "Personnel": same  
as above.

Page 35 "Institute": Place name spelled incorrectly.  
Should read Nanaimo, B.C.



All 1964 Publications Nos. 1 - 12 inclusive.  
The Note at the end of chapter on Observed Data  
Headings in Section II should read: "TRC" (trace)  
is reported when a chemical entry has a value smaller  
than the standard deviation of measurement for that  
particular variable.





121  
CANADIAN OCEANOGRAPHIC DATA CENTRE

615 Booth Street - Ottawa 4

Data Record

HUDSON BAY PROJECT - 1961

(C.O.D.C. Reference: C.R.N. 337)

No. 1

1964 Data Record Series

Programmed by the Canadian Committee on Oceanography

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

Hudson Bay Project - 1961

Ship	M. V. "Theta"
Local cruise designation	TA 61-2
Cruise period	July 12 - October 15, 1961
Observers	See Section I, pp 13, 15.



## SECTION I

**Description of data collection procedures**







THETA

Christensen Canadian Enterprises Ltd.

Photograph made before vessel's modification prior to the cruise.





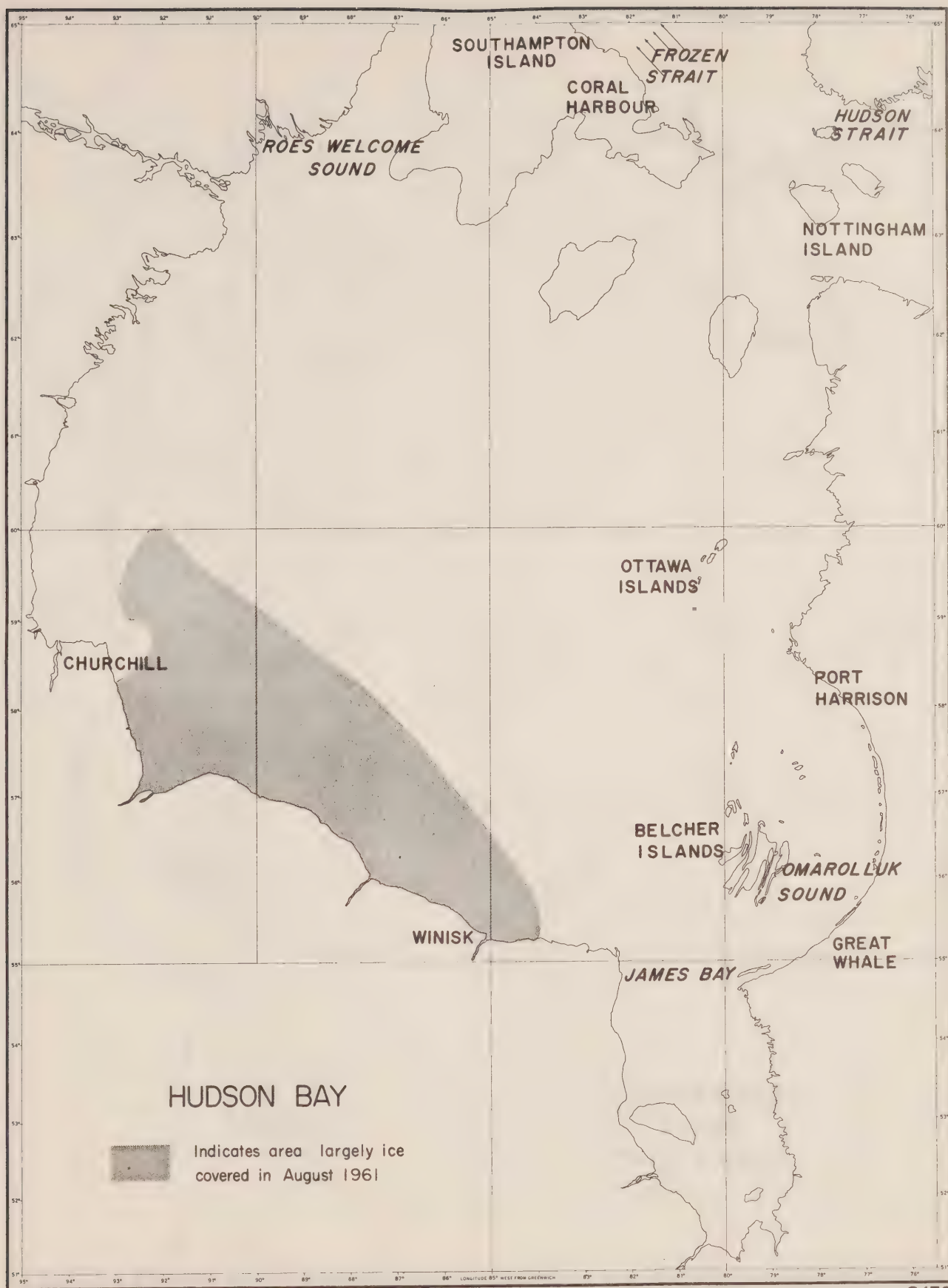


Figure 1.



Figure 2.

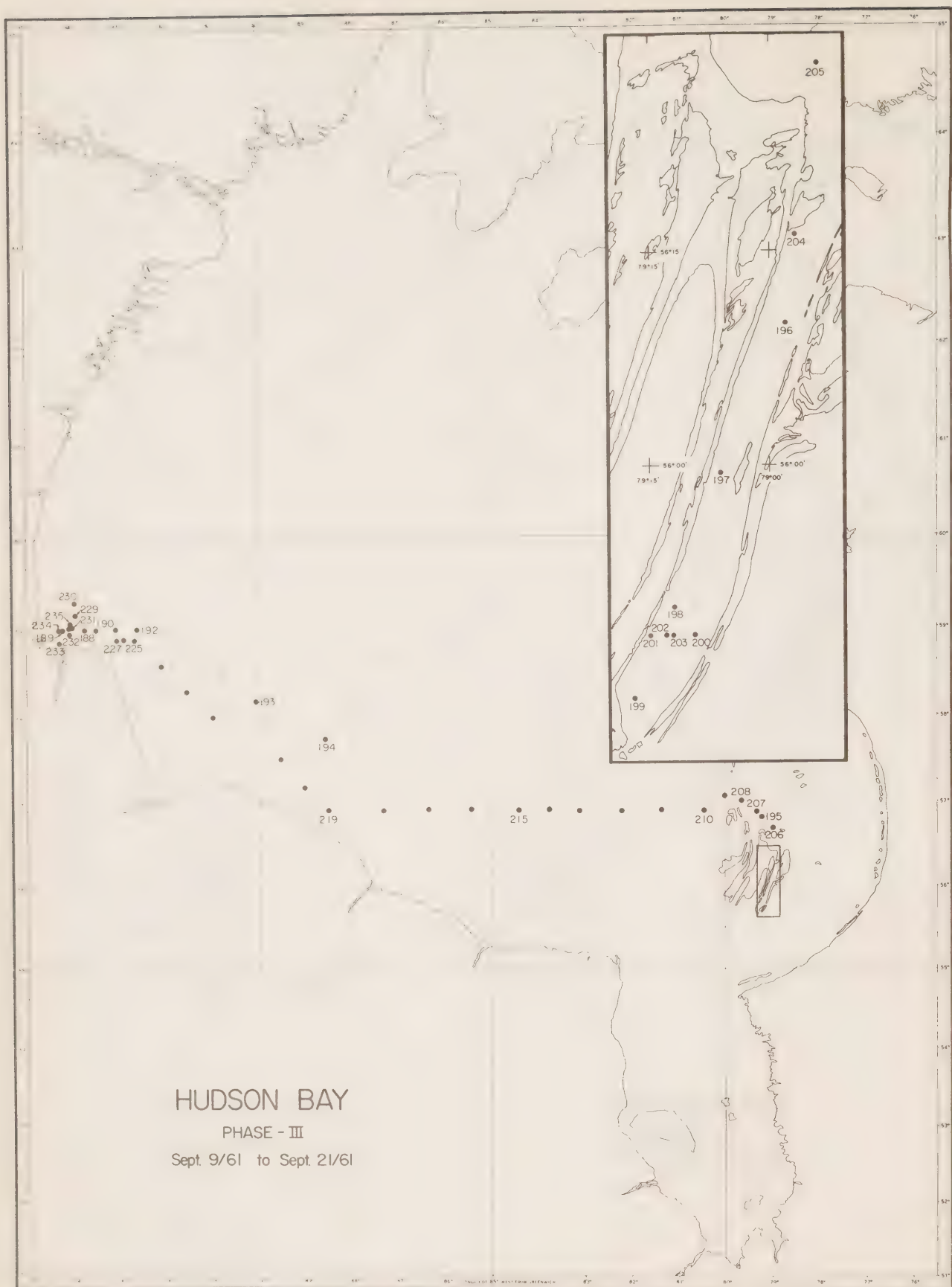




Published by the Canadian Hydrographic Service, Marine Sciences Branch,  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS, OTTAWA

S-176

Figure 3.





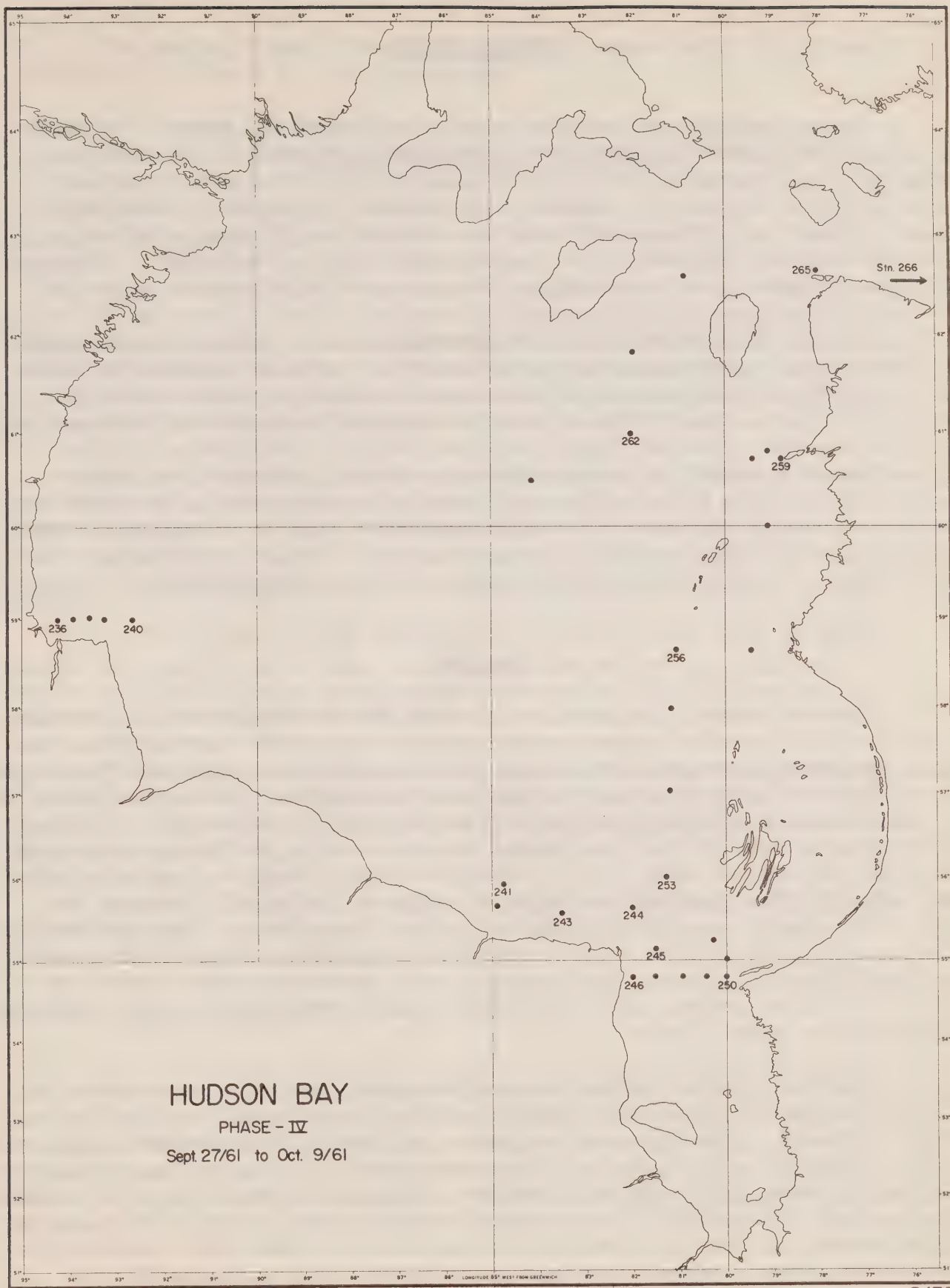


Figure 5.

## INTRODUCTION

The oceanographic data contained herein were obtained on a survey of the Hudson Bay area in 1961 carried out in the Motor Vessel Theta (frontispiece). The vessel was chartered by the Department of Mines and Technical Surveys in that year to progress current survey in the Gulf of St. Lawrence and to initiate a programme of oceanographic studies in Hudson Bay. The current survey was completed and the vessel alongside in Halifax by early July when outfitting for oceanographic survey was undertaken. Subsequent movements of the vessel are indicated here in the section titled "Extract of Cruise Log".

In brief, Theta departed Halifax en route Hudson Bay on July 15 and arrived again at Halifax on the completion of the survey on October 15. During the course of the survey few delays occurred which could be attributed to factors other than weather conditions. Several major malfunctions of ship and scientific equipment did occur which threatened the conduct of the survey; however, these were overcome through assistance provided by representatives at Churchill of such agencies as the National Harbours Board, Defence Research Board and the Fisheries Research Board. Also acknowledged is the varied assistance provided by Department of Transport personnel through ice and weather forecasts, communications facilities, and general navigational advice. Finally, the enthusiastic support of both the scientific staff and ship's company in Theta is acknowledged.

### General

The main purpose of the survey was to obtain data of an exploratory or reconnaissance nature which would allow assessment of certain of the general characteristics of the region. Secondary purposes included training of personnel and the development of techniques for use of items of geophysical equipment then under development. Opportunities were to be provided to investigate gravity, geomagnetism and sub-bottom stratification with equipment and personnel provided by other Departmental Branches including the Geological Survey of Canada and the Dominion Observatory. A biological sampling programme was to be undertaken on behalf of the Fisheries Research Board of Canada (Arctic Unit, Montreal) who proposed to survey the area of Roes Welcome Sound and Frozen Strait (Figure I) during the same season in M.V. Calanus. An investigation had been made previously in this vessel of southeast Hudson Bay and James Bay (Grainger, 1960), and the Fisheries Expedition of 1930 in SS Loubyrne (Hachey, 1931) had carried out fishing operations and a serial sampling programme over much of the Bay.

It had been proposed that the Bay would be surveyed at least twice (two synoptics) during the season and that ship-time would be available for equipment trials, likely in the vicinity of Churchill. The programme was adhered to closely although changes in detail were required to suit the ice and weather conditions experienced. In particular the coverage in the southwestern part of the Bay was not as intensive as planned. During the survey 266 stations were occupied. At a majority of these serial data were observed (as well as other data) but a small number consisted only of either a lowering of the gravimeter or of a bathythermograph or both. There are about 28 of these so that this record comprises serial data obtained at about 238 stations.



The general programme was divided into four phases mainly for purpose of logistics and are adhered to in this presentation.

### PROGRAMME AND PERSONNEL

#### Phase I July 22 - August 1

As it was not known to what extent the movement of the vessel would be restricted by ice-cover, a specific purpose other than training of personnel had not been established for this phase. It developed that the northern part of the Bay was relatively ice-free so that it was decided to carry out a survey north of the latitude of Churchill. Stations were occupied in three east-west sections (Figure 2) the main observations being serial data and sea floor sampling.

Personnel comprised F.G. Barber, C.C. Johnson, R.J. Leslie, J.G. Mackay, H.W. MacPhail, A.C. Stuart and J. Whitteker.

#### Phase II August 2 - September 5

The main purpose was to obtain as good an overall coverage of the Bay as possible with regard to serial data, magnetometer data and sea floor sampling. It was realized that if ice conditions did not improve (based on air observations of July 31) the work in the south-western part of the Bay would be seriously hampered.

Ice-conditions in this sector did not improve so that data were not obtained there (Figure 3), however in the other areas the survey progressed as planned. Considerable magnetometer data were obtained and observations utilizing underwater cameras and piston corers made.

Personnel comprised F.G. Barber, J. Butters, C.C. Johnson, R.J. Leslie, J.G. Mackay, H.W. MacPhail, W.J. Stauffer, A.C. Stuart and J. Whitteker.

#### Phase III September 9 - 21

The main object was to develop satisfactory observational techniques with regard to a sea floor gravimeter and a sub-bottom profiler (sparker). It had been planned that the initial trials would be carried out close to Churchill, but because of persistent and strong north westerly winds it was decided to conduct the work in Omarolluk Sound. The programme was concluded with a traverse of the Bay and an examination in the approach to Churchill Harbour during which nearly all the observational techniques were utilized (Figure 4).

Personnel comprised F.G. Barber, M.J. Berry, J. Butters, A. Goodacre, P.J. Hood, C.C. Johnson, R.J. Leslie, J.G. MacKay, H.W. MacPhail, B.R. Pelletier, A.C. Stuart, and J.R. Weber.





Station 127



Station 130



Station 138



Station 166

Phase IV    September 27 - October 9

Weather conditions hampered the survey during this phase but it was possible to re-occupy a number of stations and to obtain some data in Ungava Bay while en route Halifax (Figure 5).

Personnel comprised F.G. Barber, J. Butters, B. Margetts, J.G. MacKay and A.C. Stuart.

STATION OBSERVATION PROCEDURES

Serial data were obtained at standard depths using Knudsen type reversing bottles fitted with Richter & Wiese and Yoshino reversing thermometers. In the relatively shallow water of the Bay one cast only was required; "soak" time being 10 minutes. This was followed by a bathythermograph lowering and then a cast for a sea floor sample using either a Dietz la Fond type grab or a van Deen type dredge. Leslie (1963a) has described a portion of the latter material. During Phase III about thirty lowerings of the sea floor gravimeter were made. A compilation of Hodgson (1963) includes a brief description of these observations and reports by Hood (1963, 1964) present results of the magnetometer and profiler data.

Other sea floor sampling techniques included coring with a small (150 pound) piston corer and a small (85 pound) gravity corer. About 50 cores were so obtained. An underwater camera system comprising two side-by-side mounted 35 mm cameras, light source and sonar transducer was also available and was used at 8 stations (see plate).

Plankton samples were obtained at a number of stations by hauling vertically a number 6 net with an opening one meter in diameter.

Samples at the surface for temperature, salinity, and dissolved oxygen were obtained using a hand-held chemical thermometer and a plastic bucket.

Samples for dissolved oxygen determinations were drawn at most stations for immediate titration, and then samples for salinity determinations were drawn into new flat 8 oz. glass medicine bottles with hard plastic caps fitted with polythene inserts. These were stored in the ship for determination ashore (Ottawa). Samples for determination of microplankton were drawn from the reversing bottles at some stations.

From each grab sample a small amount was removed at the surface and preserved in separate container with rose bengal dye in alcohol as described by Leslie (1963b).



## LABORATORY PROCEDURES AND EVALUATION OF SERIAL DATA

The tabulated depths were obtained through readings of the wire rope angle and of an uncalibrated meter block of standard type.

At stations 1 to 33 inclusive temperatures tabulated at each depth are the average of two readings of one reversing thermometer. At higher numbered stations the tabulated temperatures are the means of two readings of two thermometers on each reversing bottle. Utilizing the techniques of Fofonoff (1963) a precision of  $0.026^{\circ}\text{C}$  has been calculated for these observations so that the least significant difference between two tabulated values is  $0.037^{\circ}\text{C}$ .

The bulk of the salinity determinations were carried out using a conductivity salinometer described by Cox (1961) with an extended range bridge. The tabulated values are the average of at least two determinations using a different cell for each. The determinations at stations 1 to 5 inclusive were made by titration using the low precision technique described by Strickland et al (1960). The precision of the salinometer determinations is considered to be high. Errors arising from sample contamination through faulty sampling and storage likely exist and, as well, it is probable that a significant systematic error exists at the low salinity values generally experienced in the near surface waters of the Bay. The salinometer was utilized in a bridge comparison experiment described by Bertholf (1963) at sample values of salinity about 29.7 and  $34.1\text{ ‰}$ .

Dissolved oxygen determinations were made using a modified Winkler procedure as described by Strickland et al (loc cit).

The presentation of data in this report is subject to modification and possible correction at a later date. The usual errors including blunders are known to exist in the observed material but no attempt has been made to interpret or adjust values. The original records are on file at the Marine Sciences Branch, Ottawa.

## BATHYTHERMOGRAPH DATA

The bathythermograph slides (263) and the original BT log are at the Bedford Institute of Oceanography, Dartmouth.

## EXTRACT OF CRUISE LOG

A trial of equipment was carried out in Bedford Basin on

July 12	and a number of difficulties encountered which delayed departure to
July 15	Depart Halifax en route Hudson Bay.
July 17	Rendezvous CHS Baffin in Niger Bay and pass mail and provisions.
July 21	A bathythermograph lowering made in Hudson Strait. A proposed series of BT lowerings postponed as winch malfunctioned.



Phase I

July 22 Occupy station 1.  
 July 23 Occupy stations 2 to 10. Heavy fog in afternoon.  
 July 24 Occupy stations 11 to 19.  
 July 25 Occupy stations 20 to 26.  
 July 26 Occupy stations 27 to 31.  
 July 27 Occupy stations 32 to 34.  
 July 28 Occupy stations 35 to 45.  
 July 29 Occupy stations 46 to 52. Progress slowed due to north westerly winds of force 6 to 7.  
 July 30 Occupy stations 53 to 55 (stations 53 and 54 BT lowering only). Wind abated by afternoon but by noon in 5 to 6 tenths ice.  
 July 31 Occupy stations 56 to 58. Progress slowed in early morning because of fog and ice. Spoke to Master CMS Labrador and indicated Theta would not require either water or fuel as arranged previously.  
 Aug. 1 Arrive Churchill.

Phase II

Aug. 2 Leave Churchill and occupy stations 59 and 60. Messrs. Butters and Stauffer join.  
 Aug. 3 Occupy stations 61 to 71.  
 Aug. 4 Occupy stations 72 to 76.  
 Aug. 5 Occupy stations 77 to 80.  
 Aug. 6 Occupy stations 81 to 85.  
 Aug. 7 Occupy stations 86 to 90. Arrive Port Harrison. Thunder storm with gale force NW winds and heavy rain.  
 Aug. 8 Occupy stations 91 and 92.  
 Aug. 9 Occupy stations 93 to 96. Anchor off Great Whale in late evening. While at anchor carried out trials with piston corer.  
 Aug. 10 Occupy stations 97 to 104.  
 Aug. 11 Occupy stations 105 to 110.  
 Short stop between stations 108 and 109 to repair main engine fuel pump; carry out further trials of piston corer.  
 Aug. 12 Occupy stations 111 to 114.  
 Aug. 13 Occupy stations 115 to 119. Stop in late evening because of heavy ice.  
 Aug. 14 Occupy stations 120 and 121.  
 Aug. 15 Occupy stations 122 to 126. Proceeding Churchill.  
 Aug. 16 Worked around ice boundary lying NE of Churchill and arrived there in evening.  
 Aug. 17  
 and 18 At Churchill.  
 Aug. 19 Occupy station 127 (camera lowering only). Carry out examination of reported magnetic anomaly and trials with the underwater camera system.  
 Aug. 20 Occupy station 128.  
 Aug. 21 Occupy station 129 and 130.  
 Aug. 22 Occupy station 131 to 134.

Aug. 23 Occupy station 135 to 139.  
 Aug. 24 Occupy station 140 to 145.  
 Aug. 25 Occupy station 146 to 153.  
 Aug. 26 Occupy station 154 to 158.  
 Aug. 27 Occupy station 159 to 162.  
 Aug. 28 Occupy station 163. Stop briefly at Coral Harbour.  
 Aug. 29 Occupy stations 164 to 169.  
 Aug. 30 Occupy stations 170 to 174.  
 Aug. 31 Occupy stations 175 to 178.  
 Sept. 1 Occupy stations 179 to 182.  
 Sept. 2 Occupy stations 183 to 185.  
 Sept. 3 Occupy stations 186 and 187. In late afternoon NW wind to force 7 to 8.  
 Sept. 4 Proceeding Churchill. Gale force winds.  
 Sept. 5 At anchor Churchill Harbour. Undertake installation of continuous  
 to 7 profiler and gravimeter. Mr. Whitteker leave.

### Phase III

Sept. 8 Drs. Pelletier, Hood, Weber and Messrs. Berry and Goodacre join.  
 Mr. Stauffer leave.  
 Sept. 9 Proceed to equipment trials seaward of Churchill.  
 Sept. 10 Occupy stations 188 to 192. NW winds to force 7 with little prospect of  
 change. Decide to proceed vicinity Belcher Islands for further trials  
 with gravimeter and sparker.  
 Sept. 11 Occupy stations 193 and 194. NW winds continue strong.  
 Sept. 12 Proceeding Belcher Islands. NW winds continue.  
 Sept. 13 Occupy stations 195 to 197. Stop briefly north of North Belcher Islands  
 then proceed into Omarolluk Sound at daylight.  
 Sept. 14 Occupy stations 198 to 203 for gravimeter observations mainly.  
 Sept. 15 Occupy station 204.  
 Sept. 16 Occupy stations 205 to 210. Proceeding Churchill.  
 Sept. 17 Occupy stations 211 to 217.  
 Sept. 18 Occupy stations 218 to 222.  
 Sept. 19 Occupy stations 223 to 230.  
 Sept. 20 Occupy stations 231 to 233. Arrive Churchill. Dr. Pelletier and Mr.  
 Johnson leave.  
 Sept. 21 Occupy stations 234 and 235. Gravimeter cable covering torn at station  
 234. Ship's gyro compass malfunction.  
 Sept. 22 At Churchill. Gyro compass from M.V. Calanus installed in Theta.  
 to 26 Drs. Hood and Weber and Messrs. Berry, Leslie and Goodacre leave.  
 Mr. Margetts join.

Phase IV

Sept. 27      Occupy stations 236 to 238.  
 Sept. 28      Occupy stations 239 and 240. Return to Churchill briefly. Mr. MacPhail leave.  
 Sept. 29  
     and 30      Proceeding James Bay section.  
 Oct. 1        Occupy stations 241 to 244.  
 Oct. 2        Occupy stations 245 to 252.  
 Oct. 3        Occupy stations 253 to 256.  
 Oct. 4        Occupy stations 257 and 258. Anchor north side Cape Smith in evening; southerly winds force 7 to 8.  
 Oct. 5        At anchor.  
 Oct. 6        Occupy stations 259 to 261.  
 Oct. 7        Occupy stations 262 to 264.  
 Oct. 8        Occupy station 265. Propose number of BT lowerings at positions in Hudson Strait and Ungava Bay. NW winds up to storm force in afternoon.  
 Oct. 9        Wind down to force 7 by noon.  
 Oct. 10       Occupy station 266 in Ungava Bay. Proceeding Halifax.  
 Oct. 11  
     to 14      Proceeding Halifax.  
 Oct. 15      Arrive.





## SECTION II

Description of the machine-generated data record





## INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation cycle.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. If interpolations are carried out, additional derived quantities are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct image masters. These masters subsequently yield the required volume of copies for distribution.

## EXPLANATION OF DATA RECORD HEADINGS

## MASTER HEADINGS

(1) C-REF-NO	(6) YR	(10) DEPTH	(15) WAVES 1	(20) AIR T	(25) VIS
(2) CONS. NO	(7) MONTH	(11) MXSAMPD	(16) WAVES 2	(21) WET B	(26) STN
(3) LAT	(8) DAY	(12) NO. DPTH	(17) WND-DIR	(22) WW-CODE	
(4) LON	(9) HR	(13) W-COLOR	(18) WND-FCE	(23) CLD-TPE	
(5) MARSD SQ		(14) W-TRNSP	(19) BARO	(24) CLD-AMT	(27) HW

- (1) CRUISE REFERENCE NUMBER: Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the C.R.N. was a number designated by C.O.D.C.
- (2) CONSECUTIVE NUMBER: Indicates the chronological order in which the stations were occupied.
- (3) LATITUDE: Latitude and longitude give the position of the platform at the time of
- (4) LONGITUDE: observation
- (5) MARSDEN SQUARE: Designates the geographic area code (see marsden square chart) in which the observation is located.
- (6) YEAR:
- (7) MONTH:
- (8) DAY:

## CANADIAN OCEANOGRAPHIC DATA CENTRE

[illegible][illegible]

- (9) HOUR: The time (Greenwich Mean Time) at which the Master-card data were recorded.  
It is reported to tenths of hours (Table 1).  
If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.
- (10) DEPTH: The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section II. Charted depths are denoted by the sounding value, preceded by the letter "C".
- (11) MAXIMUM  
SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).  
00 m - 50 m = 00  
51 m - 150 m = 01  
151 m - 250 m = 02  
etc.
- (12) NUMBER OF  
DEPTHS: The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch cards).
- (13) WATER COLOUR: A code based on the percentage of yellow (see table 2 and NOTE under FIELD "14" below).
- (14) WATER  
TRANSPARENCY: The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;
- NOTE: The "GENERAL INFORMATION" chapter in section II of the data record will state which method was used.
- (15) WAVES 1  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (16) WAVES 2  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the predominant other-than wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (17) WIND DIRECTION: The true direction to the nearest 10 degrees from which the wind is blowing. Wind direction 990 means:—wind variable or direction unknown.
- (18) WIND FORCE  
(WND-FCE): Beaufort Notation (See Table 6).
- WIND SPEED  
(WND-SPD): Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section II.
- (19) BAROMETER: The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section II of the data record will state the type of instrument used.



- (20) AIR TEMPERATURE: In degrees Celsius.
- (21) WET BULB: In degrees Celsius.
- (22) ww CODE: Present Weather Code (See Table 7). Ref: WMO Code 4677
- (23) CLOUD TYPE: The type of predominating clouds (See Table 8). Ref: WMO Code 0500.
- (24) CLOUD AMOUNT: The sky coverage in eighths (See Table 9) Ref: WMO Code 2700
- (25) VISIBILITY: Visibility at the surface (See Table 10). Ref: WMO Code 4300.
- (26) STATION: A station reference number, assigned by the institute prior to, or during the survey.
- (27) HOURS AFTER HIGH WATER: Indicates the state of the tide for nearshore observations.

## OBSERVED DATA HEADINGS

(1) GMT	(2) DEPTH	(3) TEMP	(4) SAL	(5) OXYGEN	(6) SGMT
(7) SOUND	(8) $PO_4$	(9) -P-	(10) $NO_2$	(11) $NO_3$	(12) $SiO_3$
				(13) pH.	

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

- (1) G.M.T.: The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

- (2) DEPTH: The depth in metres at the moment the oceanographic bottle reversed.
- (3) TEMPERATURE: Temperatures from deepsea reversing thermometers, read to 0.01° C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of this section.
- (4) SALINITY: Salinity as defined by:  $S = 0.03 + 1.805 C1‰$ , reported in: 1/1000 parts per 1000.
- (5) OXYGEN: The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places.

- (6) SIGMA-T: The specific gravity anomaly as defined by:  $(\text{Specific gravity} - 1) \times 10^3$  (e.g.,  $\sigma_t$  reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).
- (7) SOUND: The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.

### SPECIAL CHARACTERS

‡ (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs

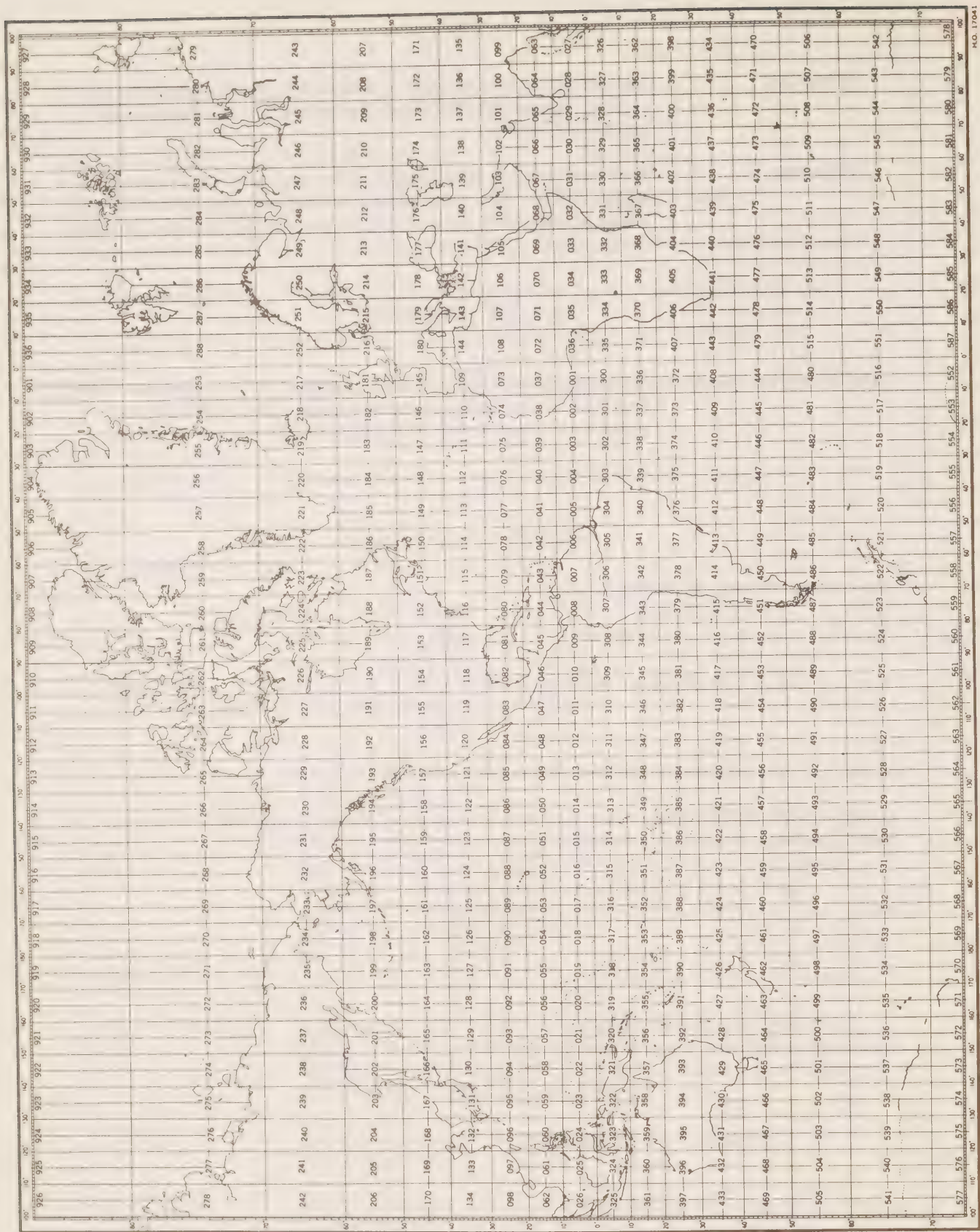
### DOUBTFUL DATA CODES

The doubtful data are reported as follows:

Code	Doubtful Data
1	depth
2	temperature
3	salinity
4	any combination of 1, 2, and 3,
5	oxygen

NOTE: Codes 1 to 4 inclusive take precedence over code 5

Location of the doubtful data code is in the "Observed Data" portion, immediately to the left of the "GMT" column.



MARSDEN SQUARE CHART



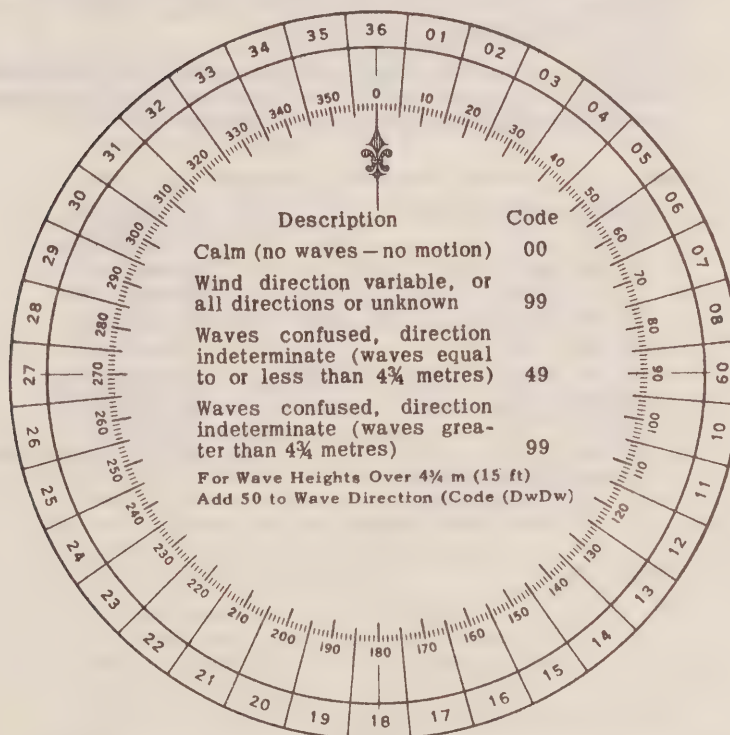
**Table 1**  
**CONVERSION**  
**MINUTES TO  $\frac{1}{10}$  HRS.**

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

**Table 2**  
**WATER COLOR CODE**  
**Based on Percentage Yellow**

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

**Table 3. DIRECTION CODE (dd)**



**NOTE:**

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.

**Table 4. PERIOD OF THE WAVES ( $P_w$ )**  
(Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

**Table 5. HEIGHT OF THE WAVES ( $H_w$ )**

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 =  $\frac{1}{4}$  m (1 ft) to  $\frac{3}{4}$  m ( $2\frac{1}{2}$  ft); 5 =  $2\frac{1}{4}$  m (7 ft) to  $2\frac{3}{4}$  m (9 ft); 9 =  $4\frac{1}{4}$  m ( $13\frac{1}{2}$  ft) to  $4\frac{3}{4}$  m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of  $2\frac{3}{4}$  m is reported by code figure 5.

Code			Code	
0	Less than ¼ m (1 ft)		0	5 m (16 ft)
1	½ m ( 1½ ft)		1	5½ m (17½ ft)
2	1 m ( 3 ft)		2	6 m (19 ft)
3	1½ m ( 5 ft)	Add	3	6½ m (21 ft)
4	2 m ( 6½ ft)	50	4	7 m (22½ ft)
5	2½ m ( 8 ft)	to	5	7½ m (24 ft)
6	3 m ( 9½ ft)	Dw Dw	6	8 m (25½ ft)
7	3½ m (11 ft)		7	8½ m (27 ft)
8	4 m (13 ft)		8	9 m (29 ft)
9	4½ m (14 ft)		9	9½ m (30½ ft) or more
x	Height not determined			

Table 6. WIND FORCE CODE

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane



Table 7. PRESENT WEATHER

W.W. CODE

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

Code figure			
ww			
No meteors except photometeors	00	Cloud development not observed or not observable	characteristic change of the state of sky during the past hour
	01	Clouds generally dissolving or becoming less developed	
	02	State of sky on the whole unchanged	
Haze, dust, sand or smoke	03	Clouds generally forming or developing	
	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes	
	05	Haze	
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen	
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no dustorm or sandstorm	
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour	
	10	Mist	
	11	Patches of	shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
	12	More of less continuous	
	13	Lightning visible, no thunder heard	
	14	Precipitation within sight, not reaching the ground or the surface of the sea	
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station	
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	
	17	Thunderstorm, but no precepitation at the time of observation	
	18	Squalls	at or within sight of the station during the preceding hour or at the time of observation
	19	Funnel clouds	
ww = 20 - 29			
	20	Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation	
	21	Drizzle (not freezing) or snow grains	not falling as shower(s)
	22	Rain (not freezing)	
	23	Snow	
	24	Rain and snow or ice pellets, type (a)	
	25	Freezing drizzle or freezing rain	
	26	Shower(s) of rain	
	27	Shower(s) of snow, or of rain and snow	
	28	Shower(s) of hail, or of rain and hail	
	29	Fog or ice fog	
ww = 30 - 39			
	30	Duststorm, sandstorm, drifting or blowing snow	
	31	Slight or moderate dust-storm or sand-storm	- has decreased during the preceding hour - no appreciable change during the preceding hour - has begun or has increased during the preceding hour
	32		
	33	Severe dust-storm or sand-storm	- has decreased during the preceding hour - no appreciable change during the preceding hour - has begun or has increased during the preceding hour
	34		
	35		
	36	Slight or moderate blowing snow	generally low (below eye level)
	37	Heavy drifting snow	
	38	Slight or moderate blowing snow	generally high (above eye level)
	39	Heavy blowing snow	
ww = 40 - 49			
	40	Fog or ice fog at the time of observation	
	41	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer	
	42	Fog or ice fog in patches	
	43	Fog or ice fog, sky visible	has become thinner during the preceding hour
	44	Fog or ice fog, sky invisible	
	45	Fog or ice fog, sky visible	no appreciable change during the preceding hour
	46	Fog or ice fog, sky invisible	
	47	Fog or ice fog, sky visible	has begun or has become thicker during the preceding hour
	48	Fog or ice fog, sky invisible	
	49	Fog, depositing rime, sky visible	
		Fog, depositing rime, sky invisible	

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

## ww = 50 - 59 Drizzle

- |    |  |   |                                      |
|----|--|---|--------------------------------------|
| 50 | Drizzle, not freezing, intermittent          | { | slight at time of observation        |
| 51 | Drizzle, not freezing, continuous            |   |                                      |
| 52 | Drizzle, not freezing, intermittent          | { | moderate at time of observation      |
| 53 | Drizzle, not freezing, continuous            |   |                                      |
| 54 | Drizzle, not freezing, intermittent          | { | heavy (dense) at time of observation |
| 55 | Drizzle, not freezing, continuous            |   |                                      |
| 56 | Drizzle, freezing, slight                    |   |                                      |
| 57 | Drizzle, freezing, moderate or heavy (dense) |   |                                      |
| 58 | Drizzle and rain, slight                     |   |                                      |
| 59 | Drizzle and rain, moderate or heavy          |   |                                      |

## ww = 60 - 69 Rain

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 60 | Rain, not freezing, intermittent            | { | slight at time of observation   |
| 61 | Rain, not freezing, continuous              |   |                                 |
| 62 | Rain, not freezing, intermittent            | { | moderate at time of observation |
| 63 | Rain, not freezing, continuous              |   |                                 |
| 64 | Rain, not freezing, intermittent            | { | heavy at time of observation    |
| 65 | Rain, not freezing, continuous              |   |                                 |
| 66 | Rain, freezing, slight                      |   |                                 |
| 67 | Rain, freezing, moderate or heavy           |   |                                 |
| 68 | Rain or drizzle and snow, slight            |   |                                 |
| 69 | Rain or drizzle and snow, moderate or heavy |   |                                 |

## 70 - 79 Solid precipitation not in showers

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 70 | Intermittent fall of snow flakes                      | { | slight at time of observation   |
| 71 | Continuous fall of snow flakes                        |   |                                 |
| 72 | Intermittent fall of snow flakes                      | { | moderate at time of observation |
| 73 | Continuous fall of snow flakes                        |   |                                 |
| 74 | Intermittent fall of snow flakes                      | { | heavy at time of observation    |
| 75 | Continuous fall of snow flakes                        |   |                                 |
| 76 | Ice prisms (with or without fog)                      |   |                                 |
| 77 | Snow grains (with or without fog)                     |   |                                 |
| 78 | Isolated starlike snow crystals (with or without fog) |   |                                 |
| 79 | Ice pellets, type (a)                                 |   |                                 |

## ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

- |    |  |   |   |
|----|--|---|---|
| 80 | Rain shower(s), slight   |   |   |
| 81 | Rain shower(s), moderate or heavy  |   |   |
| 82 | Rain shower(s), violent  |   |   |
| 83 | Shower(s) of rain and snow mixed, slight   |   |   |
| 84 | Shower(s) of rain and snow mixed, moderate or heavy  |   |   |
| 85 | Snow shower(s), slight   |   |   |
| 86 | Snow shower(s), moderate or heavy  |   |   |
| 87 | Shower(s) of snow pellets or ice pellets, type (b), with or without rain or rain and snow mixed  | { | - slight  |
| 88 |  |   |   |
| 89 | Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder      | { | - slight  |
| 90 |  |   |   |
| 91 | Slight rain at time of observation   | { | thunderstorm during the preceding hour but not at time of observation |
| 92 | Moderate or heavy rain at time of observation  |   |   |
| 93 | Slight snow, or rain and snow mixed or hail at time of observation                               |   |   |
| 94 | Moderate or heavy snow, or rain and snow mixed or hail at time of observation                    |   |   |
| 95 | Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation | { | thunderstorm at time of observation                                   |
| 96 | Thunderstorm, slight or moderate, with hail at time of observation                               |   |   |
| 97 | Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation              |   |   |
| 98 | Thunderstorm, combined with duststorm or sandstorm at time of observation                        |   |   |
| 99 | Thunderstorm, heavy, with hail at time of observation  |   |   |

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus ..... Ci	5	Nimbostratus ..... Ns
1	Cirrocumulus ..... Cc	6	Stratocumulus ..... Sc
2	Cirrostratus ..... Cs	7	Stratus ..... St
3	Alto cumulus ..... Ac	8	Cumulus ..... Cu
4	Altostratus ..... As	9	Cumulonimbus ..... Cb
X	Cloud not visible owing to darkness, fog, dust storm, sand storm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta =  $\frac{1}{8}$  of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
90	Less than 50 metres (less than 55 yards)
91	50-200 metres (approx. 55-220 yards)
92	200-500 metres (approx. 220-550 yards)
93	500-1,000 metres (approx. 550 yards- $\frac{5}{8}$ n.m.)
94	1-2 km (approx. $\frac{3}{8}$ -1 n.m.)
95	2-4 km (approx. 1-2 n.m.)
96	4-10 km (approx. 2-6 n.m.)
97	10-20 km (approx. 6-12 n.m.)
98	20-50 km (approx. 12-30 n.m.)
99	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile



GENERAL INFORMATION

<u>Institute:</u>	Division of Oceanographic Research, Ottawa.
<u>Observation platform:</u>	M.V. "Theta"
<u>Vessel's cruising speed:</u>	9 knots
<u>Total number of station occupied:</u>	266
<u>Anemometer height above sea level:</u>	10 metres
<u>Water Transparency</u>	was obtained using a Secchi Disc
<u>Barometer readings</u>	were obtained using an Aneroid Barometer and were corrected prior to recording
<u>Air temperature</u>	was observed from a Sling Psychrometer
<u>Wet bulb temperature</u>	was observed from a Sling Psychrometer
<u>Surface sea water temperature</u>	was obtained from a plastic bucket using a hand-held chemical thermometer.



## SECTION III

Serial oceanographic data





C-REF-NO 337	YR 1961	DEPTH 481	WAVES 1	XX	AIR T 05.4	VIS
CONS. NO 001	MONTH 7	MXSAMPD 03	WAVES 2	XX	WET B 04.8	STN 001
LAT 62-413N	DAY 22	NO.DPTH 11	WND-DIR		WW-CODE	
LON 77-540W	HR 21.8	W-COLOR	WND-FCE		CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
218	0000	0420	30080	823	2389	14611
218	0010	0158	31130	907	2493	14513
218	0020		31490	828		
218	0030	0058	31670	823	2542	14478
218	0050	0020	32020	783	2572	14469
218	0075	-0044	32390	722	2604	14449
218	0100	-0086	32630	757	2625	14437
218	0144	-0093	32840	743	2642	14444
218	0192	-0081	32980	755	2653	14459
218	0240	-0079	33080	744	2661	14469
218	0280	-0072	33130	733	2665	14480

C-REF-NO 337	YR 1961	DEPTH 488	WAVES 1 00X0	AIR T 06.3	VIS 96
CONS. NO 002	MONTH 7	MXSAMPD 03	WAVES 2 XO	WET B 05.7	STN 002
LAT 62-350N	DAY 23	NO.DPTH 11	WND-DIR CALM	WW-CODE 02	
LON 78-530W	HR 02.4	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1003.2	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
024	0000	0481	28820	806	2283	14620
024	0010		29350	851		
024	0020	0028		961		
024	0030	-0073	32220	840	2592	14425
024	0050	-0093	32770	766	2637	14427
024	0075	-0088	32800	766	2639	14434
024	0100	-0095	32910	752	2648	14436
024	0150	-0084	32960	761	2652	14450
024	0200	-0086	32990	748	2654	14458
024	0250	-0083	33170	744	2669	14470
024	0300	-0077	33170	730	2668	14482

C-REF-NO 337	YR 1961	DEPTH 176	WAVES 1 XX	AIR T 08.5	VIS 96
CONS. NO 003	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.2	STN 003
LAT 62-160N	DAY 23	NO.DPTH 8	WND-DIR 270	WW-CODE 02	
LON 79-020W	HR 05.3	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1002.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
053	0000	0740	28830	737	2254	14726
053	0010	0690	28940	749	2269	14709
053	0020	0249	29710	867	2373	14535
053	0030	-0053	30420	919	2446	14410
053	0050	-0094	31460	709	2531	14408
053	0075	-0086	32730	722	2633	14434
053	0100	-0087	32990	726	2654	14441
053	0150	-0087	33110	723	2664	14451

C-REF-NO 337	YR 1961	DEPTH 80	WAVES 1 X0	AIR T 08.2	VIS 96
CONS. NO 004	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 07.4	STN 004
LAT 62-000N	DAY 23	NO.DPTH 6	WND-DIR 220	WW-CODE 02	
LON 79-150W	HR 07.9	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1003.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
079	0000	0579	29250	784	2307	14666
079	0010	0550	29210	801	2307	14656
079	0020	0481	29330	808	2323	14630
079	0030	-0054	29970	873	2410	14403
079	0050	-0099	31630	741	2545	14408
079	0070	-0104	32440	701	2610	14421



C-REF-NO 337	YR 1961	DEPTH 141	WAVES 1	XO	AIR T 09.1	VIS 97
CONS. NO 005	MONTH 7	MXSAMPD 01	WAVES 2	XO	WET B 08.3	STN 005
LAT 62-000N	DAY 23	NO.DPTH 8	WND-DIR 280	WW-CODE 02		
LON 79-000W	HR 09.2	W-COLOR	WND-FCE 02	CLD-TPE		
MARSD SQ 224		W-TRNSP	BARO 1003.0	CLD-AMT 8	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
092	0000	0600	29440	767	2319	14677
092	0010	0595	29440	773	2320	14677
092	0020	0146	29900	897	2395	14492
092	0030	-0054	30700	867	2468	14413
092	0050	-0104	31860	703	2563	14409
092	0075	-0102	32780	692	2638	14427
092	0100	-0098	32870	706	2645	14434
092	0130	-0095	32930	709	2650	14442

C-REF-NO 337	YR 1961	DEPTH 146	WAVES 1	XO	AIR T 08.0	VIS 96
CONS. NO 006	MONTH 7	MXSAMPD 01	WAVES 2	XO	WET B 07.4	STN 006
LAT 62-000N	DAY 23	NO.DPTH 8	WND-DIR 340	WW-CODE		
LON 78-390W	HR 10.6	W-COLOR	WND-FCE 04	CLD-TPE		
MARSD SQ 224		W-TRNSP	BARO 1003.7	CLD-AMT 8	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
106	0000	0660	29000	722	2278	14696
106	0010	0520	29130	795	2304	14642
106	0020	0095	29756	823	2386	14467
106	0030	-0128	30934	867	2489	14382
106	0050	-0110	31873		2565	14407
106	0075	-0092	32770	707	2637	14432
106	0100	-0088	32923	737	2649	14440
106	0130	-0086	32967	722	2652	14446

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 XX	AIR T 06.8	VIS 98
CONS. NO 007	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 06.2	STN 007
LAT 61-582N	DAY 23	NO.DPTH 4	WND-DIR 340	WW-CODE	
LON 78-140W	HR 12.2	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1004.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
122	0000	0548	29402	781	2322	14656
122	0010	0462	29389	795	2330	14621
122	0020	0076	29783	811	2389	14459
122	0030	0064	30514	781	2449	14465

C-REF-NO 337	YR 1961	DEPTH 58	WAVES 1 XX	AIR T 09.1	VIS 99
CONS. NO 008	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 08.1	STN 008
LAT 61-260N	DAY 23	NO.DPTH 5	WND-DIR 360	WW-CODE 01	
LON 78-100W	HR 16.0	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1004.0	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
160	0000	0840	28338	723	2203	14758
3 160	0010	0393	30229	824	2403	14603
3 160	0020	-0020	29117	830	2340	14405
160	0030	-0109	31015	824	2495	14392
160	0050	-0111	31273	687	2516	14398

C-REF-NO 337	YR 1961	DEPTH 132	WAVES 1 XX	AIR T 08.9	VIS 0
CONS. NO 009	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.1	STN 009
LAT 61-250N	DAY 23	NO.DPTH 7	WND-DIR 350	WW-CODE	
LON 78-510W	HR 18.7	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1006.7	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
187	0000	0830	28735	716	2235	14760
187	0010	0716	28922	739	2265	14719
187	0020	0276	29379	823	2345	14543
187	0030	-0092	30446	809	2449	14392
187	0050	-0124	31779	650	2557	14399
187	0075	-0116	32559	593	2620	14417
187	0100	-0102	32799	678	2639	14432

C-REF-NO 337	YR 1961	DEPTH 71	WAVES 1 XX	AIR T 10.2	VIS 98
CONS. NO 010	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 09.0	STN 010
LAT 61-250N	DAY 23	NO.DPTH 5	WND-DIR 340	WW-CODE	
LON 79-420W	HR 21.5	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1007.6	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
215	0000	0910	29143	728	2255	14795
215	0010	0757	29121	735	2275	14738
215	0020	0212	29810	856	2384	14520
215	0030	-0045	30556	808	2456	14415
215	0050	-0085	31660	722	2547	14415

C-REF-NO 337	YR 1961	DEPTH 109	WAVES 1 32X3	AIR T 09.1	VIS 99
CONS. NO 011	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.4	STN 011
LAT 61-255N	DAY 24	NO.DPTH 7	WND-DIR 320	WW-CODE	
LON 80-440W	HR 01.3	W-COLOR 50	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP 15	BARO 1010.3	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
013	0000	0745	28894	881	2259	14728
013	0010	0736	28877	722	2259	14726
013	0020	0125	29458	881	2361	14477
013	0030	-0069	30741	875	2472	14407
013	0050	-0119	32020	649	2577	14404
013	0075	-0111	32638	643	2627	14421
013	0100	-0114	32927	606	2650	14428

C-REF-NO 337	YR 1961	DEPTH 194	WAVES 1 XX	AIR T 09.4	VIS 99
CONS. NO 012	MONTH 7	MXSAMPD 02	WAVES 2 XX	WET B 08.6	STN 012
LAT 61-370N	DAY 24	NO.DPTH 9	WND-DIR 360	WW-CODE 02	
LON 81-230W	HR 04.1	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1010.3	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
041	0000	0840	29043	738	2258	14767
041	0010	0626	29139	795	2293	14686
041	0020	-0098	30287	879	2436	14385
041	0030	-0101	31151	779	2506	14397
041	0050	-0121	32269	637	2597	14407
041	0075	-0119	32752	608	2636	14419
041	0100	-0119	32933	664	2651	14425
041	0150	-0128	33100	572	2664	14432
041	0175	-0138	33167	506	2670	14432



C-REF-NO 337	YR 1961	DEPTH 208	WAVES 1 XX	AIR T 10.9	VIS 99
CONS. NO 013	MONTH 7	MXSAMPD 02	WAVES 2 XX	WET B 09.6	STN 013
LAT 61-480N	DAY 24	NO.DPTH 9	WND-DIR 320	WW-CODE 02	
LON 82-000W	HR 07.3	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1010.7	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
073	0000	0820	29342	728	2284	14764
073	0010	0800	29356	734	2288	14758
073	0020	0168	29594	882	2369	14498
073	0029	-0092	30487	884	2452	14392
073	0049	-0127	32151	638	2588	14402
073	0074	-0128	32786	590	2639	14415
073	0098	-0116	32932	652	2650	14427
073	0147	-0126	33093	580	2664	14432
073	0196	-0140	33177	508	2671	14435

C-REF-NO 337	YR 1961	DEPTH 154	WAVES 1 29X2	AIR T 07.3	VIS 99
CONS. NO 014	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 06.8	STN 014
LAT 61-580N	DAY 24	NO.DPTH 8	WND-DIR 290	WW-CODE	
LON 82-330W	HR 10.0	W-COLOR 40	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP 15	BARO 1011.4	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
100	0000	0740	29580	708	2313	14735
100	0010	0608	29630	823	2333	14685
100	0020	-0011	30505	881	2451	14429
100	0030	-0115	31889	896	2566	14401
100	0050	-0145	32295	767	2600	14396
100	0075	-0146	32634	722	2627	14404
100	0100	-0141	32777	722	2639	14413
100	0140	-0118	32919	694	2650	14432

C-REF-NO 337	YR 1961	DEPTH 51	WAVES 1 XX	AIR T 09.1	VIS 98
CONS. NO 015	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 07.9	STN 015
LAT 62-000N	DAY 24	NO.DPTH 5	WND-DIR 290	WW-CODE 02	
LON 83-080W	HR 11.8	W-COLOR 40	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP 21	BARO 1012.4	CLD-AMT 2	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	118	0000	0745	30034	748	2348	14743
	118	0010	0679	30099	767	2362	14720
	118	0020	-0054	30909	896	2485	14414
3	118	0030	-0127	32665	852	2629	14406
3	118	0045	-0129	32043	845	2579	14399

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 143	WAVES 1 32X2	AIR T 09.1	VIS 98
CONS. NO 016	MONTH 7	MXSAMPD 01	WAVES 2 XO	WET B 07.9	STN 016
LAT 62-000N	DAY 24	NO.DPTH 8	WND-DIR 320	WW-CODE	
LON 84-000W	HR 14.6	W-COLOR 40	WND-FCE 02	CLD-TPE	
MARSD SQ 225		W-TRNSP 15	BARO 1003.4	CLD-AMT 2	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	146	0000	0480	30674	838	2430	14644
	146	0010	0461	30673	808	2432	14638
	146	0020	-0026	31681	838	2546	14438
	146	0030	-0126	32259	707	2596	14401
	146	0050	-0146	32591	707	2624	14400
	146	0068	-0145	32838	722	2644	14407
	146	0100	-0131	32882	694	2647	14419
	146	0125	-0122	32885	650	2647	14427

C-REF-NO 337	YR 1961	DEPTH 135	WAVES 1 XX	AIR T 09.9	VIS 99
CONS. NO 017	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.7	STN 017
LAT 62-130N	DAY 24	NO.DPTH 8	WND-DIR 010	WW-CODE 02	
LON 84-490W	HR 18.1	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1014.1	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
181	0000	0830	30324	823	2359	14780
181	0010	0626	30541	750	2403	14704
181	0020	0002	31333	937	2517	14446
181	0030	-0126	31903	810	2568	14396
181	0050	-0134	32400	654	2608	14403
181	0075	-0118	32747	650	2636	14419
181	0100	-0117	32861	647	2645	14425
181	0125	-0117	32867	638	2645	14430

C-REF-NO 337	YR 1961	DEPTH 122	WAVES 1 XX	AIR T 11.8	VIS 99
CONS. NO 018	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 09.8	STN 018
LAT 62-306N	DAY 24	NO.DPTH 7	WND-DIR 030	WW-CODE 02	
LON 85-400W	HR 21.7	W-COLOR 30	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP 22	BARO 1015.1	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
217	0000	0830	30453	708	2369	14782
217	0010	0762	30882	751	2412	14763
217	0020	0004	31458	867	2527	14449
217	0030	-0028	31739	715	2551	14440
217	0050	-0132	32311	902	2601	14402
217	0075	-0140	32675	660	2630	14408
217	0110	-0128	32770	650	2638	14421



C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1 00X0	AIR T 10.2	VIS 99
CONS. NO 019	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 09.6	STN 019
LAT 62-306N	DAY 25	NO.DPTH 8	WND-DIR CALM	WW-CODE 02	
LON 86-550W	HR 02.6	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1016.8	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
026	0000	0878	30572	737	2371	14802
026	0010	0766	31007	737	2421	14766
026	0020	-0019	31421	981	2525	14438
026	0030	-0096	31873	968	2564	14410
026	0050	-0144	32620	707	2626	14401
026	0075	-0152	32681	685	2631	14402
026	0100	-0152	32673	693	2630	14406
026	0115	-0152	32699	693	2633	14409

C-REF-NO 337	YR 1961	DEPTH 128	WAVES 1 00X0	AIR T 09.1	VIS 99
CONS. NO 020	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.4	STN 020
LAT 62-306N	DAY 25	NO.DPTH 8	WND-DIR CALM	WW-CODE 02	
LON 88-120W	HR 06.8	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 225		W-TRNSP 15	BARO 1018.8	CLD-AMT 0	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
068	0000	0800	31360	732	2444	14782
068	0010	0701	31562	742	2474	14747
068	0020	0065	31888	981	2559	14483
068	0030	-0094	32163	883	2588	14415
068	0050	-0158	32319	763	2602	14390
068	0075	-0151	32647	657	2628	14402
068	0100	-0151	32880	682	2647	14410
068	0115	-0155	32933	666	2652	14411



C-REF-NO 337	YR 1961	DEPTH 170	WAVES 1 00X0	AIR T 06.9	VIS 99
CONS. NO 021	MONTH 7	MXSAMPD 02	WAVES 2 XX	WET B 06.3	STN 021
LAT 62-300N	DAY 25	NO.DPTH 9	WND-DIR CALM	WW-CODE 02	
LON 89-305W	HR 11.1	W-COLOR 40	WND-FCE 00	CLD-TPE	
MARSD SQ 225		W-TRNSP 17	BARO 1020.8	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
111	0000	0599	27758	810	2187	14655
111	0010	0300	29699	867	2369	14556
111	0020	0067	31708	896	2544	14481
111	0030	-0090	32292	852	2598	14418
111	0050	-0133	32640	722	2627	14406
111	0075	-0152	32987	707	2656	14406
111	0100	-0173	33196	686	2673	14404
111	0150	-0176	33366	693	2687	14413
111	0160	-0178	33391	700	2689	14414

C-REF-NO 337	YR 1961	DEPTH 154	WAVES 1 XX	AIR T 08.6	VIS 99
CONS. NO 022	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 07.9	STN 022
LAT 62-160N	DAY 25	NO.DPTH 8	WND-DIR 240	WW-CODE 02	
LON 90-000W	HR 14.0	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 226		W-TRNSP 20	BARO 1022.2	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
140	0000	0850	31125	742	2419	14798
140	0010	0633	31738	757	2496	14723
140	0020	0381	31923	827	2538	14622
140	0030	-0090	31979	879	2573	14414
140	0050	-0131	32263	743	2597	14402
140	0075	-0138	32698	742	2632	14409
140	0100	-0158	32999	661	2657	14408
140	0150	-0178	33296	727	2682	14411

C-REF-NO 337	YR 1961	DEPTH 130	WAVES 1 XX	AIR T 09.3	VIS 99
CONS. NO 023	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.3	STN 023
LAT 62-000N	DAY 25	NO.DPTH 8	WND-DIR 220	WW-CODE 02	
LON 90-350W	HR 19.6	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 226		W-TRNSP 21	BARO 1021.8	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
196	0000	0780	31589	757	2465	14777
196	0010	0590	31615	784	2492	14704
196	0020	0285	31737	867	2532	14579
196	0030	0078	31911	898	2560	14491
196	0050	-0142	32133	755	2587	14395
196	0075	-0145	32852	633	2645	14408
196	0100	-0156	33059	626	2662	14410
196	0120	-0158	33085	627	2664	14412

C-REF-NO 337	YR 1961	DEPTH 101	WAVES 1 00X0	AIR T 07.9	VIS 98
CONS. NO 024	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 07.3	STN 024
LAT 62-000N	DAY 25	NO.DPTH 7	WND-DIR CALM	WW-CODE 02	
LON 91-390W	HR 22.9	W-COLOR 30	WND-FCE 00	CLD-TPE	
MARSD SQ 226		W-TRNSP 18	BARO 1022.2	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
229	0000	0640	31167	794	2450	14716
229	0010	0564	31725	802	2503	14694
229	0020	0347	31895	823	2539	14607
229	0030	0148	32379	874	2593	14529
229	0050	-0004	32765	823	2633	14468
229	0075	-0125	32772	701	2638	14416
229	0090	-0138	32811	677	2641	14413

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 11	WAVES 1 00X0	AIR T 05.9	VIS 98
CONS. NO 025	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 05.3	STN 025
LAT 62-000N	DAY 26	NO.DPTH 3	WND-DIR CALM	WW-CODE 02	
LON 92-000W	HR 00.2	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1021.8	CLD-AMT 3	HW

## O B S E R V E

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
002	0000	0480	31501	751	2495	14655
002	0001	0497	31478	811	2491	14662
002	0010	0297	31807	831	2537	14583

C-REF-NO 337	YR 1961	DEPTH 51	WAVES 1 00X0	AIR T 05.9	VIS 98
CONS. NO 026	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 05.3	STN 026
LAT 62-000N	DAY 26	NO.DPTH 4	WND-DIR CALM	WW-CODE 02	
LON 91-540W	HR 00.7	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1021.8	CLD-AMT 3	HW

## O B S E R V E

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
007	0000	0560	31399	808	2478	14687
007	0010	0424	31512	808	2502	14633
007	0020	0283	31825	831	2539	14579
007	0035	0261	31893	822	2546	14573

C-REF-NO 337	YR 1961	DEPTH 93	WAVES 1 00X0	AIR T 05.6	VIS 98
CONS. NO 027	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 05.6	STN 027
LAT 61-290N	DAY 26	NO.DPTH 6	WND-DIR CALM	WW-CODE 02	
LON 92-415W	HR 05.0	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 226		W-TRNSP 11	BARO 1023.5	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
050	0000	0340	32219	866	2566	14606
050	0010	0222	32233	851	2576	14556
050	0020	0187	32261	851	2581	14543
050	0030	0163	32278	844	2584	14534
050	0050	0146	32301	838	2587	14530
050	0075	0054	32372	812	2598	14494

C-REF-NO 337	YR 1961	DEPTH 38	WAVES 1 11X3	AIR T 08.3	VIS 98
CONS. NO 028	MONTH 7	MXSAMPD 00	WAVES 2 XX	WET B 07.3	STN 028
LAT 61-000N	DAY 26	NO.DPTH 4	WND-DIR 110	WW-CODE 03	
LON 93-480W	HR 09.9	W-COLOR 40	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP 17	BARO 1020.8	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
099	0000	0670	30487	767	2393	14719
099	0008	0666	30514	850	2396	14719
099	0017	0638	31176	838	2478	14615
099	0032	0258	31648	838	2527	14568



C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 11X3	AIR T 07.9	VIS 98
CONS. NO 029	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 07.3	STN 029
LAT 61-000N	DAY 26	NO.DPTH 7	WND-DIR 110	WW-CODE 03	
LON 93-020W	HR 12.6	W-COLOR 30	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP 15	BARO 1022.5	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
126	0000	0659	32292	852	2536	14739
126	0010	0470	32318	824	2561	14664
126	0020	0316	32358	858	2579	14600
126	0030	0086	32474	867	2605	14502
126	0050	-0088	32561	779	2620	14426
126	0075	-0129	32604	737	2624	14412
126	0090	-0135	32607	737	2625	14412

C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1 XX	AIR T 09.9	VIS 99
CONS. NO 030	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.0	STN 030
LAT 61-000N	DAY 26	NO.DPTH 8	WND-DIR 090	WW-CODE 02	
LON 92-150W	HR 15.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP 15	BARO 1022.9	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
158	0000	0900	29881	727	2314	14801
158	0010	0541	31681	823	2503	14684
158	0020	0404	32135	829	2553	14635
158	0030	0052	32244	897	2588	14483
158	0050	-0115	32501	701	2616	14413
158	0075	-0151	32695	779	2632	14403
158	0100	-0160	32748	650	2637	14403
158	0110	-0158	32752	657	2637	14406

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 10X3	AIR T 06.8	VIS 99
CONS. NO 031	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 06.2	STN 031
LAT 61-000N	DAY 26	NO.DPTH 8	WND-DIR 100	WW-CODE 02	
LON 90-080W	HR 22.5	W-COLOR 30	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP 15	BARO 1022.9	CLD-AMT 5	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	225	0000	0570	27455	824	2166	14639
	225	0010	0239	28596	926	2285	14514
3	225	0020	-0082	31151	958	2506	14405
3	225	0030	-0105	31580	941	2541	14401
3	225	0050	-0154	30508	678	2455	14367
	225	0075	-0146	32656	672	2629	14405
	225	0100	-0152	33052	606	2661	14412
	225	0115	-0151	33069	593	2663	14415

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 176	WAVES 1 XX	AIR T 06.8	VIS 99
CONS. NO 032	MONTH 7	MXSAMPD 02	WAVES 2 XX	WET B 06.2	STN 032
LAT 60-540N	DAY 27	NO.DPTH 9	WND-DIR 090	WW-CODE 02	
LON 88-050W	HR 05.4	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP 09	BARO 1021.5	CLD-AMT 3	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	054	0000	0450	26625	991	2113	14578
	054	0010	-0058		967		
	054	0020	-0081	30757	938	2474	14400
	054	0030	-0145	31268	874	2517	14378
	054	0050	-0146	31964	767	2573	14391
	054	0075	-0120	32737	652	2635	14418
	054	0100	-0124	32894	694	2648	14423
	054	0150	-0142	33090	563	2664	14425
	054	0160	-0144	33081	563	2663	14426

C-REF-NO 337	YR 1961	DEPTH 205	WAVES 1	XX	AIR T 06.5	VIS 99
CONS. NO 033	MONTH 7	MXSAMPD 02	WAVES 2	XX	WET B 05.9	STN 033
LAT 60-500N	DAY 27	NO.DPTH 9	WND-DIR 090	WW-CODE 01		
LON 86-420W	HR 12.1	W-COLOR 00	WND-FCE 04	CLD-TPE		
MARSD SQ 225		W-TRNSP 19	BARO 1021.5	CLD-AMT 4	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
121	0000	0357	21799	852	1738	14474
121	0010	0005	29720	852	2387	14424
121	0020	-0096	30703	846	2470	14392
121	0030	-0146	31005	873	2495	14374
121	0050	-0155	31710	751	2553	14383
121	0075	-0142	32947	680	2652	14411
121	0100	-0145	33084	593	2664	14415
121	0150	-0151	33167	542	2670	14422
121	0190	-0153	33282	464	2680	14429

C-REF-NO 337	YR 1961	DEPTH 188	WAVES 1	XX	AIR T 11.0	VIS 99
CONS. NO 034	MONTH 7	MXSAMPD 02	WAVES 2	XX	WET B 09.7	STN 034
LAT 60-460N	DAY 27	NO.DPTH 9	WND-DIR 090	WW-CODE 02		
LON 84-000W	HR 20.5	W-COLOR 40	WND-FCE 04	CLD-TPE		
MARSD SQ 225		W-TRNSP 19	BARO 1019.8	CLD-AMT 2	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
205	0000	0990	29417	701	2264	14829
205	0010	0978	29411	694	2266	14826
205	0020	-0005	30151	879	2422	14427
205	0030	-0132	30876	878	2485	14379
205	0050	-0130	32298	622	2600	14403
205	0075	-0128	32835	606	2643	14416
205	0100	-0140	32835	606	2643	14414
205	0150	-0150	33016	482	2658	14420
205	0175	-0151	33239	477	2676	14427

\*TIME-DISTANCE CHECK FAILED



C-REF-NO 337	YR 1961	DEPTH 166	WAVES 1 XX	AIR T 09.4	VIS 99
CONS. NO 035	MONTH 7	MXSAMPD 02	WAVES 2 XX	WET B 08.9	STN 035
LAT 60-520N	DAY 28	NO.DPTH 9	WND-DIR 090	WW-CODE 03	
LON 81-520W	HR 03.4	W-COLOR 50	WND-FCE 02	CLD-TPE	
MARSD SQ 225		W-TRNSP 14	BARO 1018.5	CLD-AMT 8	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	034	0000	0730	25968	795	2032	14685
	034	0010	0782	29117	734	2271	14748
	034	0020	-0038	29559	880	2376	14403
3	034	0030	-0132	32195	838	2591	14397
3	034	0050	-0137	30776	643	2477	14378
3	034	0075	-0135	32783	643	2639	14412
3	034	0100	-0134	30847	795	2482	14389
	034	0150	-0147	33190	470	2672	14424
	034	0160	-0148	33196	488	2673	14425

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 137	WAVES 1 00X0	AIR T 10.6	VIS 99
CONS. NO 036	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 10.0	STN 036
LAT 60-580N	DAY 28	NO.DPTH 8	WND-DIR CALM	WW-CODE 03	
LON 80-000W	HR 09.6	W-COLOR 40	WND-FCE 00	CLD-TPE	
MARSD SQ 225		W-TRNSP 22	BARO 1014.4	CLD-AMT 7	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	096	0000	0950	28991	707	2237	14809
	096	0010	0838	29198	756	2270	14770
	096	0020	0232	29413	816	2351	14524
	096	0030	-0102	30790	806	2477	14392
	096	0050	-0112	31938	650	2570	14407
	096	0075	-0118	32724	577	2634	14419
	096	0100	-0112	32811	628	2641	14427
	096	0125	-0112	32809	635	2640	14431



C-REF-NO 337 YR 1961 DEPTH 154 WAVES 1 00X0 AIR T 11.3 VIS 99  
 CONS. NO 037 MONTH 7 MXSAMPD 01 WAVES 2 XO WET B 10.7 STN 037  
 LAT 61-000N DAY 28 NO.DPTH 8 WND-DIR CALM WW-CODE 03  
 LON 79-200W HR 12.3 W-COLOR WND-FCE 00 CLD-TPE  
 MARSD SQ 224 W-TRNSP 25 BARO 1013.4 CLD-AMT 6 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
123	0000	1115	28517	723	2174	14863
123	0010	0803	28653	736	2232	14750
123	0020	0169	29279	845	2344	14494
123	0030	-0104	30474	838	2452	14387
123	0050	-0133	31742	672	2555	14394
123	0075	-0125	32598	599	2624	14414
123	0100	-0104	32813	687	2641	14431
123	0150	-0135	32932	478	2651	14426

C-REF-NO 337 YR 1961 DEPTH 102 WAVES 1 XO AIR T 12.2 VIS 99  
 CONS. NO 038 MONTH 7 MXSAMPD 01 WAVES 2 XO WET B 11.1 STN 038  
 LAT 61-000N DAY 28 NO.DPTH 7 WND-DIR 020 WW-CODE 03  
 LON 78-420W HR 14.6 W-COLOR 40 WND-FCE 01 CLD-TPE  
 MARSD SQ 224 W-TRNSP 21 BARO 1011.7 CLD-AMT 6 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
146	0000	1090	28514	679	2178	14854
146	0010	0778	28945	722	2258	14744
146	0020	0229	29287	846	2341	14521
146	0030	-0045	30441	838	2447	14414
3 146	0050	-0126	32406	638	2608	14406
3 146	0075	-0116	31582	664	2541	14404
146	0095	-0113	32674	650	2630	14424

C-REF-NO 337	YR 1961	DEPTH 102	WAVES 1	XO	AIR T 12.3	VIS 99
CONS. NO 039	MONTH 7	MXSAMPD 01	WAVES 2	XO	WET B 11.3	STN 039
LAT 60-510N	DAY 28	NO.DPTH 7	WND-DIR 040	WW-CODE 02		
LON 78-450W	HR 16.1	W-COLOR 50	WND-FCE 01	CLD-TPE		
MARSD SQ 224		W-TRNSP 19	BARO 1011.7	CLD-AMT 6	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
161	0000	1120	28608	731	2180	14866
161	0010	0854	28678	737	2227	14770
161	0020	0245	29217	845	2334	14527
161	0030	-0077	29942	897	2408	14392
161	0050	-0139	31333	861	2522	14385
161	0075	-0122	32318	636	2601	14411
161	0090	-0115	32623	562	2625	14421

C-REF-NO 337	YR 1961	DEPTH 60	WAVES 1	XX	AIR T 11.9	VIS 99
CONS. NO 040	MONTH 7	MXSAMPD 00	WAVES 2	XX	WET B 09.6	STN 040
LAT 60-430N	DAY 28	NO.DPTH 5	WND-DIR 040	WW-CODE 02		
LON 78-470W	HR 17.4	W-COLOR 50	WND-FCE 03	CLD-TPE		
MARSD SQ 224		W-TRNSP 18	BARO 1011.4	CLD-AMT 5	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
174	0000	0680	29174	766	2289	14706
174	0010	0413	29372	788	2333	14600
174	0020	0144	29579	823	2370	14487
174	0030	0100	29848	839	2393	14472
174	0050	-0053	31050	811	2497	14422

C-REF-NO 337	YR 1961	DEPTH 126	WAVES 1 XX	AIR T 12.1	VIS 99
CONS. NO 041	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 10.7	STN 041
LAT 60-430N	DAY 28	NO.DPTH 8	WND-DIR 010	WW-CODE 02	
LON 79-050W	HR 19.0	W-COLOR 20	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP 16	BARO 1010.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
190	0000	1090	28357	693	2166	14852
190	0010	0701	28858	754	2262	14712
190	0020	0218	29243	823	2338	14515
190	0030	-0113	30374	805	2444	14381
190	0050	-0144	31360	733	2524	14383
190	0075	-0126	32348	575	2604	14410
190	0100	-0133	32793	493	2640	14417
190	0110	-0133	32844	482	2644	14419

C-REF-NO 337	YR 1961	DEPTH 150	WAVES 1 XX	AIR T 12.4	VIS 99
CONS. NO 042	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 10.8	STN 042
LAT 60-430N	DAY 28	NO.DPTH 8	WND-DIR 010	WW-CODE 02	
LON 79-240W	HR 20.4	W-COLOR 40	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP 19	BARO 1008.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
204	0000	1140	28494	693	2168	14872
204	0010	0959	28709	706	2214	14810
204	0020	0244	29177	837	2331	14526
204	0030	-0094	30607	818	2462	14393
204	0050	-0127	32109	616	2584	14402
204	0075	-0126	32531	527	2618	14412
204	0100	-0129	32791	545	2639	14419
204	0135	-0141	32983	448	2655	14422



C-REF-NO 337	YR 1961	DEPTH 155	WAVES 1 XX	AIR T 12.8	VIS 99
CONS. NO 043	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 11.7	STN 043
LAT 60-330N	DAY 28	NO.DPTH 8	WND-DIR 030	WW-CODE 02	
LON 79-240W	HR 21.9	W-COLOR 40	WND-FCE 04	CLD-TPE	
MARSD SQ 224		W-TRNSP 21	BARO 1007.3	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
219	0000	1120	28704	678	2188	14867
219	0010	0956	28817	717	2223	14810
219	0020	0212	29298	839	2343	14513
219	0030	-0106	30642	845	2465	14388
219	0050	-0108	31470	796	2532	14402
219	0075	-0109	32476	564	2613	14420
219	0100	-0102	32768	664	2637	14431
219	0140	-0138	33055	470	2661	14425

C-REF-NO 337	YR 1961	DEPTH 161	WAVES 1 04X3	AIR T 11.9	VIS 98
CONS. NO 044	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 10.7	STN 044
LAT 60-230N	DAY 28	NO.DPTH 8	WND-DIR 040	WW-CODE 02	
LON 79-250W	HR 23.6	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1007.3	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
236	0000	1098	29030	695	2217	14864
236	0010	0898	29264	708	2266	14794
236	0020	0331	29383	838	2341	14567
236	0030	-0034	30559	852	2456	14420
3 236	0050	-0111	31788	679	2558	14405
3 236	0075	-0119	30903	796	2487	14393
236	0100	-0110	32795	645	2639	14428
236	0150	-0141	33030	453	2659	14425



C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 00X0	AIR T 11.8	VIS 98
CONS. NO 045	MONTH 7	MXSAMPD 01	WAVES 2 XO	WET B 11.2	STN 045
LAT 60-000N	DAY 29	NO.DPTH 8	WND-DIR CALM	WW-CODE 02	
LON 79-020W	HR 02.9	W-COLOR 50	WND-FCE 00	CLD-TPE	
MARSD SQ 224		W-TRNSP 15	BARO 1004.6	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
029	0000	1151	27549	667	2093	14864
029	0010	0873	28771	716	2232	14778
029	0020	0324	29291	807	2334	14563
029	0030	-0086	30505	839	2454	14395
029	0050	-0117	32043	657	2579	14406
029	0075	-0120	32627	599	2626	14417
029	0100	-0107	32783	657	2638	14429
029	0115	-0129	32870	549	2646	14422

C-REF-NO 337	YR 1961	DEPTH 134	WAVES 1 XO	AIR T 12.9	VIS 96
CONS. NO 046	MONTH 7	MXSAMPD 01	WAVES 2 XO	WET B 12.3	STN 046
LAT 59-330N	DAY 29	NO.DPTH 8	WND-DIR 180	WW-CODE 03	
LON 79-020W	HR 06.0	W-COLOR 50	WND-FCE 01	CLD-TPE	
MARSD SQ 188		W-TRNSP 12	BARO 1003.9	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
060	0000	1170	25661	680	1944	14848
060	0010	0698	28501	767	2234	14706
060	0020	0285	29113	839	2323	14543
060	0030	-0022	29546	874	2374	14412
060	0050	-0142	31306	752	2520	14383
060	0075	-0128	32321	607	2601	14408
060	0100	-0135	32871	492	2646	14417
060	0120	-0135	32898	488	2648	14421

C-REF-NO 337	YR 1961	DEPTH 115	WAVES 1 XX	AIR T 09.4	VIS 96
CONS. NO 047	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 08.8	STN 047
LAT 59-030N	DAY 29	NO.DPTH 7	WND-DIR 180	WW-CODE 41	
LON 79-180W	HR 09.4	W-COLOR 40	WND-FCE 02	CLD-TPE	
MARSD SQ 188		W-TRNSP 16	BARO 1007.6	CLD-AMT 9	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	094	0000	1090	26913	723	2054	14834
	094	0010	0800	27768	765	2163	14737
	094	0020	0086	29353	863	2355	14457
2	094	0030	-0039	29963	767	2409	14410
	094	0050	-0135	30877	795	2485	14381
	094	0075	-0144	31730	672	2554	14393
	094	0100	-0136	32640	488	2627	14413

TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 77	WAVES 1 XX	AIR T 07.7	VIS 96
CONS. NO 048	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 07.3	STN 048
LAT 58-370N	DAY 29	NO.DPTH 6	WND-DIR 180	WW-CODE	
LON 78-490W	HR 13.8	W-COLOR 10	WND-FCE 02	CLD-TPE	
MARSD SQ 188		W-TRNSP 18	BARO 1001.2	CLD-AMT 9	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	138	0000	0910	26174	767	2024	14758
	138	0010	0349	28502	810	2270	14561
	138	0020	0226	29178	823	2333	14518
	138	0030	-0036	30042	779	2415	14412
	138	0050	-0129	31289	707	2518	14389
	138	0070	-0139	31863	650	2565	14396

C-REF-NO 337	YR 1961	DEPTH 159	WAVES 1 XX	AIR T 08.6	VIS 97
CONS. NO 049	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 07.9	STN 049
LAT 58-380N	DAY 29	NO.DPTH 8	WND-DIR 180	WW-CODE	
LON 79-090W	HR 14.8	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 188		W-TRNSP 17	BARO 1000.5	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
148	0000	0985	26477	728	2037	14790
148	0010	0876	27993	779	2171	14770
148	0020	0112	29306	890	2349	14469
148	0030	-0090	30200	879	2429	14389
148	0050	-0143	31445	722	2531	14385
148	0075	-0141	32175	621	2590	14400
148	0100	-0139	32674	534	2630	14412
148	0150	-0138	32728	506	2635	14422

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 174	WAVES 1 XX	AIR T 09.9	VIS 97
CONS. NO 050	MONTH 7	MXSAMPD 02	WAVES 2 XO	WET B 09.4	STN 050
LAT 58-370N	DAY 29	NO.DPTH 9	WND-DIR 320	WW-CODE 11	
LON 79-300W	HR 16.4	W-COLOR 40	WND-FCE 01	CLD-TPE	
MARSD SQ 188		W-TRNSP 16	BARO 1001.2	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
164	0000	0905	28061	736	2172	14780
164	0010	0088	29370	847	2356	14457
164	0020	0023	29638	817	2380	14432
164	0030	-0013	29853	808	2399	14420
164	0050	-0124	30792	751	2478	14385
164	0075	-0166	31568	808	2541	14380
164	0100	-0147	32350	613	2604	14404
164	0150	-0139	32739	498	2636	14422
164	0160	-0137	32747	506	2636	14424



C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1 XX	AIR T 09.6	VIS 98
CONS. NO 051	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 08.4	STN 051
LAT 58-370N	DAY 29	NO.DPTH 8	WND-DIR 320	WW-CODE 01	
LON 80-290W	HR 20.1	W-COLOR 43	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP 21	BARO 1003.2	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
201	0000	0920	27596	722	2133	14780
201	0010	0237	28664	881	2291	14514
201	0020	-0089	30340	946	2440	14390
201	0030	-0142	31055	881	2499	14377
201	0050	-0165	31601	818	2544	14377
201	0075	-0134	32358	571	2605	14406
201	0110	-0136	32741	482	2636	14416
201	0115	-0147	33151	470	2669	14418

C-REF-NO 337	YR 1961	DEPTH 181	WAVES 1 23X4	AIR T 07.8	VIS 97
CONS. NO 052	MONTH 7	MXSAMPD 01	WAVES 2 XX	WET B 07.2	STN 052
LAT 58-370N	DAY 29	NO.DPTH 7	WND-DIR 230	WW-CODE 03	
LON 81-160W	HR 23.6	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1006.9	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
236	0000	0915	27999		2165	14783
236	0024	-0114	30586		2461	14382
236	0040	-0143	31402		2527	14383
236	0060	-0165	31846		2564	14382
236	0080	-0148	32579		2623	14403
236	0120	-0146	33096		2665	14418
236	0136	-0148	33175		2671	14421



C-REF-NO 337	YR 1961	DEPTH 168	WAVES 1 X4	AIR T 05.2	VIS 97
CONS. NO 053	MONTH 7	MXSAMPD 00	WAVES 2 X0	WET B 04.6	STN 053
LAT 58-400N	DAY 30	NO.DPTH 1	WND-DIR 320	WW-CODE 02	
LON 82-350W	HR 05.3	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1009.7	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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053 0000

Bathythermograph observation.

C-REF-NO 337	YR 1961	DEPTH 157	WAVES 1 28X3	AIR T 04.1	VIS 97
CONS. NO 054	MONTH 7	MXSAMPD 00	WAVES 2 X0	WET B 03.3	STN 054
LAT 58-440N	DAY 30	NO.DPTH 1	WND-DIR 280	WW-CODE	
LON 83-510W	HR 09.8	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1009.7	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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098 0000

Bathythermograph observation.

C-REF-NO 337	YR 1961	DEPTH 110	WAVES 1 X3	AIR T 05.8	VIS 99
CONS. NO 055	MONTH 7	MXSAMPD 01	WAVES 2 X0	WET B 04.5	STN 055
LAT 58-510N	DAY 30	NO.DPTH 7	WND-DIR 300	WW-CODE 01	
LON 85-500W	HR 17.1	W-COLOR 50	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP 18	BARO 1011.7	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
171	0000	0030	24122	868	1937	14357
171	0010	-0046	30540	937	2455	14411
171	0020	-0090	31169	937	2507	14401
171	0030	-0135	31684	918	2550	14389
171	0050	-0164	31990	862	2575	14383
171	0075	-0150	32802	635	2641	14405
171	0095	-0150	32919	599	2650	14410

C-REF-NO 337	YR 1961	DEPTH 201	WAVES 1 31X3	AIR T 03.8	VIS 98
CONS. NO 056	MONTH 7	MXSAMPD 02	WAVES 2 3542	WET B 02.9	STN 056
LAT 59-010N	DAY 31	NO.DPTH 9	WND-DIR 310	WW-CODE 02	
LON 87-490W	HR 00.4	W-COLOR 30	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP 17	BARO 1016.8	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
004	0000	0170	25362	932	2031	14438
004	0010	-0025	29607	997	2379	14408
004	0020	-0105	31054	968	2498	14392
004	0030	-0148	31579	960	2542	14381
004	0050	-0170	31852	823	2564	14378
004	0075	-0153	32435	701	2611	14398
004	0100	-0143	32997	693	2657	14415
004	0150	-0148	33186	498	2672	14424
004	0190	-0153	33271	543	2679	14429

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1	XX	AIR T 02.9	VIS 99
CONS. NO 057	MONTH 7	MXSAMPD 01	WAVES 2	X0	WET B 02.3	STN 057
LAT 59-190N	DAY 31	NO.DPTH 8	WND-DIR 270	WW-CODE 01		
LON 91-100W	HR 16.2	W-COLOR 50	WND-FCE 02	CLD-TPE		
MARSD SQ 190		W-TRNSP 20	BARO 1016.8	CLD-AMT 2	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
162	0000	0065	25358	914	2035	14390
162	0010	-0090	29684	966	2387	14379
162	0020	-0096	30997	990	2494	14396
162	0030	-0140	31842	912	2563	14389
162	0050	-0168	32201	773	2593	14384
162	0075	-0164	32559	666	2622	14395
162	0100	-0156	32947	593	2653	14408
162	0110	-0156	32957	593	2654	14410

C-REF-NO 337	YR 1961	DEPTH 113	WAVES 1	XX	AIR T 05.5	VIS 99
CONS. NO 058	MONTH 7	MXSAMPD 01	WAVES 2	X0	WET B 04.0	STN 058
LAT 60-010N	DAY 31	NO.DPTH 8	WND-DIR 190	WW-CODE		
LON 92-000W	HR 21.3	W-COLOR 50	WND-FCE 04	CLD-TPE		
MARSD SQ 226		W-TRNSP 20	BARO 1013.4	CLD-AMT 2	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
213	0000	0190	26610	897	2130	14464
213	0010	-0098	29977	941	2411	14379
213	0020	-0150	31496	925	2535	14377
213	0030	-0159	31979	837	2574	14382
213	0049	-0169	32135	780	2587	14382
213	0074	-0162	32723	634	2635	14398
213	0098	-0162	32738	622	2636	14402
213	0104	-0162	32738	622	2636	14403

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 26	WAVES 1 XX	AIR T 12.2	VIS 99
CONS. NO 059	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 11.1	STN 059
LAT 59-000N	DAY 03	NO.DPTH 3	WND-DIR 110	WW-CODE	
LON 94-140W	HR 03.0	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1003.2	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
030	0000	0840	27628		2147	14749
030	0010	0424	28813		2288	14597
030	0020	0156	30181		2417	14500

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 XX	AIR T 11.3	VIS 99
CONS. NO 060	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 10.7	STN 060
LAT 59-000N	DAY 03	NO.DPTH 4	WND-DIR 160	WW-CODE	
LON 93-540W	HR 04.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1003.6	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
048	0000	0785	27976		2182	14732
048	0010	0059	30603		2456	14461
048	0020	-0103	31470		2532	14399
048	0030	-0111	31530		2537	14398



C-REF-NO 337	YR 1961	DEPTH 35	WAVES 1 XX	AIR T 11.1	VIS 99
CONS. NO 061	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 10.6	STN 061
LAT 59-000N	DAY 03	NO.DPTH 4	WND-DIR 180	WW-CODE 02	
LON 93-340W	HR 06.4	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1003.6	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
064	0000	0910	27560		2132	14775
064	0010	0200	30515		2441	14523
064	0020	0097	30801		2470	14482
064	0030	0048	30953		2485	14464

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 XX	AIR T 07.8	VIS 99
CONS. NO 062	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 07.1	STN 062
LAT 59-000N	DAY 03	NO.DPTH 5	WND-DIR 140	WW-CODE 02	
LON 93-160W	HR 07.6	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1003.2	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
076	0000	0360	28106		2237	14559
076	0010	0285	28496		2274	14533
076	0020	-0104	31275		2516	14396
076	0030	-0106	31307		2519	14397
076	0039	-0106	31304		2519	14399

C-REF-NO 337	YR 1961	DEPTH 93	WAVES 1 XX	AIR T 07.4	VIS 99
CONS. NO 063	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 06.8	STN 063
LAT 59-000N	DAY 03	NO.DPTH 7	WND-DIR 140	WW-CODE 03	
LON 92-400W	HR 10.1	W-COLOR 40	WND-FCE 03	CLD-TPE	
MARSD SQ 190		W-TRNSP 11	BARO 1001.5	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
101	0000	0420	22296		1773	14508
101	0009	0347	22978		1832	14487
101	0018	-0143	31549		2539	14381
101	0028	-0170	31938		2571	14375
101	0047	-0170	32112		2585	14381
101	0070	-0167	32344		2604	14390
101	0085	-0168	32345		2604	14392

C-REF-NO 337	YR 1961	DEPTH 77	WAVES 1 XX	AIR T 08.4	VIS 97
CONS. NO 064	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 07.9	STN 064
LAT 58-470N	DAY 03	NO.DPTH 6	WND-DIR 180	WW-CODE 02	
LON 92-430W	HR 12.0	W-COLOR 40	WND-FCE 03	CLD-TPE	
MARSD SQ 190		W-TRNSP 11	BARO 1001.9	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
120	0000	0460	27448		2177	14593
120	0010	0468	27676		2194	14601
120	0020	-0148	31646		2547	14381
120	0030	-0168	32009		2577	14378
120	0050	-0167	32018		2578	14382
120	0070	-0169	32061		2581	14385

C-REF-NO 337	YR 1961	DEPTH 13	WAVES 1 XX	AIR T 12.9	VIS 98
CONS. NO 065	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 11.8	STN 065
LAT 58-470N	DAY 03	NO.DPTH 2	WND-DIR 290	WW-CODE	
LON 93-000W	HR 14.0	W-COLOR 49	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP 07	BARO 1001.2	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
140	0000	0480	27902		2211	14607
140	0010	0202	29741		2379	14513

C-REF-NO 337	YR 1961	DEPTH 64	WAVES 1 XX	AIR T 09.6	VIS 97
CONS. NO 066	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 09.6	STN 066
LAT 59-210N	DAY 03	NO.DPTH 6	WND-DIR 260	WW-CODE 02	
LON 93-000W	HR 17.0	W-COLOR 40	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP 12	BARO 1001.2	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
170	0000	0410	22879		1820	14511
170	0010	0244	27203		2174	14498
170	0020	-0160	32022		2578	14380
170	0030	-0166	32055		2581	14379
170	0050	-0166	32059		2581	14383
170	0060	-0165	32060		2581	14385

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 46	WAVES 1 X3	AIR T 08.5	VIS 97
CONS. NO 067	MONTH 8	MXSAMPD 00	WAVES 2 26	WET B 08.2	STN 067
LAT 59-200N	DAY 03	NO.DPTH 5	WND-DIR 330	WW-CODE 02	
LON 93-300W	HR 18.9	W-COLOR 50	WND-FCE 03	CLD-TPE	
MARSD SQ 190		W-TRNSP 15	BARO 1002.5	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
189	0000	0391	27202		2163	14560
189	0010	0107	29449		2361	14467
189	0020	-0059	30934		2487	14412
189	0030	-0081	31325		2520	14409
189	0040	-0092	31483		2533	14408

C-REF-NO 337	YR 1961	DEPTH 71	WAVES 1 X3	AIR T 10.2	VIS 97
CONS. NO 068	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B 09.0	STN 068
LAT 59-200N	DAY 03	NO.DPTH 6	WND-DIR 310	WW-CODE 02	
LON 94-040W	HR 20.9	W-COLOR 50	WND-FCE 03	CLD-TPE	
MARSD SQ 190		W-TRNSP 18	BARO 1004.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
209	0000	0790	27643		2155	14730
209	0010	0459	28349		2248	14606
209	0020	-0121	31543		2538	14392
209	0030	-0142	31846		2563	14388
209	0050	-0159	32116		2586	14387
209	0065	-0160	32137		2587	14389



C-REF-NO 337	YR 1961	DEPTH 33	WAVES 1 X2	AIR T 12.6	VIS 97
CONS. NO 069	MONTH 8	MXSAMPD 00	WAVES 2 82	WET B 10.0	STN 069
LAT 59-200N	DAY 03	NO.DPTH 4	WND-DIR 350	WW-CODE 02	
LON 94-340W	HR 23.6	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 190		W-TRNSP 12	BARO 1007.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
236	0000	0820	29940		2330	14771
236	0010	0805	29920		2331	14767
236	0020	0516	30477		2410	14660
236	0030	0388	30899		2456	14613

C-REF-NO 337	YR 1961	DEPTH 26	WAVES 1 XX	AIR T 10.7	VIS 99
CONS. NO 070	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 09.6	STN 070
LAT 60-000N	DAY 04	NO.DPTH 3	WND-DIR 320	WW-CODE 02	
LON 94-320W	HR 04.1	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1008.0	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
041	0000	0625	30550		2404	14702
041	0010	0420	31642		2512	14634
041	0020	0371	31732		2524	14616

C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 XX	AIR T 09.6	VIS 99
CONS. NO 071	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 08.4	STN 071
LAT 60-000N	DAY 04	NO.DPTH 6	WND-DIR 350	WW-CODE 02	
LON 94-100W	HR 05.8	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1008.3	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
058	0000	0846	29971		2329	14782
058	0010	0672	30625		2404	14724
058	0020	0227	32122		2567	14558
058	0030	-0037	32421		2606	14445
058	0050	-0099	32432		2610	14420
058	0075	-0133	32435		2611	14408

C-REF-NO 337	YR 1961	DEPTH 121	WAVES 1 X2	AIR T 10.1	VIS 98
CONS. NO 072	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B 09.0	STN 072
LAT 60-000N	DAY 04	NO.DPTH 7	WND-DIR 310	WW-CODE 03	
LON 93-310W	HR 08.3	W-COLOR 50	WND-FCE 02	CLD-TPE	
MARSD SQ 226		W-TRNSP 11	BARO 1009.3	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
083	0000	0900	27633		2139	14772
083	0010	0858	27709		2151	14759
083	0020	0003	32003		2571	14456
083	0030	-0153	32327		2603	14389
083	0050	-0166	32461		2614	14388
083	0075	-0158	32567		2622	14398
083	0100	-0153	32581		2623	14404

C-REF-NO 337 YR 1961 DEPTH 95 WAVES 1 X1 AIR T 09.4 VIS 98  
 CONS. NO 073 MONTH 8 MXSAMPD 01 WAVES 2 82 WET B 08.4 STN 073  
 LAT 59-570N DAY 04 NO.DPTH 7 WND-DIR 310 WW-CODE 01  
 LON 92-460W HR 11.5 W-COLOR 40 WND-FCE 03 CLD-TPE  
 MARSD SQ 190 W-TRNSP 15 BARO 1010.7 CLD-AMT 3 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
115	0000	0730	22635		1771	14642
115	0010	-0014	28026		2252	14392
115	0020	-0113	31322		2520	14392
115	0030	-0154	32084		2583	14385
115	0050	-0170	32340		2604	14385
115	0074	-0163	32667		2630	14397
115	0089	-0164	32668		2630	14399

C-REF-NO 337 YR 1961 DEPTH 102 WAVES 1 XX AIR T 09.6 VIS 99  
 CONS. NO 074 MONTH 8 MXSAMPD 01 WAVES 2 XX WET B 09.6 STN 074  
 LAT 60-330N DAY 04 NO.DPTH 7 WND-DIR 270 WW-CODE 02  
 LON 92-320W HR 15.1 W-COLOR 20 WND-FCE 02 CLD-TPE  
 MARSD SQ 226 W-TRNSP 15 BARO 1012.0 CLD-AMT 2 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
151	0000	0938	27351		2112	14783
151	0010	0911	27364		2117	14775
151	0020	0213	31738		2538	14547
151	0030	-0006	32094		2579	14455
151	0050	-0119	32385		2606	14409
151	0075	-0160	32585		2624	14397
151	0090	-0161	32589		2624	14399

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 135	WAVES 1 X1	AIR T 07.6	VIS 99
CONS. NO 075	MONTH 8	MXSAMPD 01	WAVES 2 42	WET B 07.4	STN 075
LAT 60-310N	DAY 04	NO.DPTH 8	WND-DIR 270	WW-CODE 02	
LON 91-320W	HR 18.8	W-COLOR 50	WND-FCE 02	CLD-TPE	
MARSD SQ 226		W-TRNSP 22	BARO 1011.	CLD-AMT 1	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	188	0000	0630	27412		2156	14663
	188	0010		27677			
	188	0020	0007	31702		2547	14454
	188	0030	-0126	32024		2577	14398
3	188	0050	-0159	30167		2428	14359
	188	0075	-0162	32569		2622	14396
	188	0099	-0158	32942		2652	14407
	188	0124	-0156	33013		2658	14413

C-REF-NO 337	YR 1961	DEPTH 137	WAVES 1 21X3	AIR T 07.4	VIS 99
CONS. NO 076	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 06.8	STN 076
LAT 60-260N	DAY 05	NO.DPTH 8	WND-DIR 210	WW-CODE 03	
LON 89-360W	HR 01.0	W-COLOR 20	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP 17	BARO 1007.3	CLD-AMT 5	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	010	0000	0540	26993		2133	14621
	010	0010	0174	28670		2295	14486
	010	0020	-0054	30859		2481	14414
	010	0030	-0125	31423		2529	14390
	010	0050	-0157	31792		2559	14383
	010	0075	-0144	32771		2638	14407
	010	0100	-0148	32989		2656	14413
	010	0135	-0148	33015		2658	14419

\*TIME-DISTANCE CHECK FAILED



C-REF-NO 337	YR 1961	DEPTH 135	WAVES 1 X3	AIR T 09.2	VIS 97
CONS. NO 077	MONTH 8	MXSAMPD 01	WAVES 2 82	WET B 08.1	STN 077
LAT 60-000N	DAY 05	NO.DPTH 8	WND-DIR 270	WW-CODE 02	
LON 89-360W	HR 06.4	W-COLOR	WND-FCE 04	CLD-TPE 6	
MARSD SQ 225		W-TRNSP	BARO 1005.9	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
064	0000	0530	27057		2139	14617
064	0010	0483	27095		2147	14600
064	0020	-0076	30925		2487	14404
064	0030	-0126	31463		2532	14390
064	0050	-0156	31943		2571	14386
064	0074	-0137	32884		2647	14412
064	0099	-0147	33016		2658	14413
064	0124	-0147	33039		2660	14418

C-REF-NO 337	YR 1961	DEPTH 208	WAVES 1 24X2	AIR T 06.8	VIS 0
CONS. NO 078	MONTH 8	MXSAMPD 02	WAVES 2 2146	WET B 06.7	STN 078
LAT 60-000N	DAY 05	NO.DPTH 9	WND-DIR 240	WW-CODE 02	
LON 88-000W	HR 11.8	W-COLOR 30	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP 15	BARO 1002.9	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	0510	26745		2117	14605
118	0010	0067	29222		2345	14445
118	0020	-0086	31037		2497	14401
118	0029	-0128	31327		2521	14387
118	0049	-0158	31592		2543	14380
118	0073	-0137	32761		2637	14410
118	0097	-0136	32986		2655	14418
118	0146	-0148	33185		2672	14423
118	0185	-0152	33283		2680	14429

C-REF-NO 337	YR 1961	DEPTH 205	WAVES 1 24X3	AIR T 07.9	VIS 99
CONS. NO 079	MONTH 8	MXSAMPD 02	WAVES 2 2282	WET B 07.3	STN 079
LAT 59-575N	DAY 05	NO.DPTH 9	WND-DIR 240	WW-CODE 02	
LON 86-020W	HR 17.0	W-COLOR 40	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP 14	BARO 1002.5	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
170	0000	0648	26568		2088	14660
170	0010	0605	26620		2097	14644
170	0020	-0047	30865		2481	14417
170	0030	-0128	31226		2513	14386
170	0050	-0164	31748		2556	14379
170	0075	-0147	32960		2654	14408
170	0100	-0147	33061		2662	14414
170	0150	-0155	33210		2674	14421
170	0190	-0155	33310		2682	14429

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 141	WAVES 1 27X4	AIR T 08.5	VIS 99
CONS. NO 080	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 07.9	STN 080
LAT 60-000N	DAY 06	NO.DPTH 8	WND-DIR 270	WW-CODE 02	
LON 84-000W	HR 01.0	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1000.9	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
010	0000	0830	28189		2192	14753
010	0010	0828	28175		2191	14753
010	0019	0108	29901		2397	14475
010	0029	-0131	31185		2510	14384
010	0048	-0158	32120		2586	14387
010	0073	-0144	32955		2653	14410
010	0097	-0147	33077		2663	14414
010	0126	-0147	33141		2668	14419

C-REF-NO 337	YR 1961	DEPTH 137	WAVES 1	X2	AIR T 07.4	VIS 98
CONS. NO 081	MONTH 8	MXSAMPD 01	WAVES 2	46	WET B 06.6	STN 081
LAT 60-000N	DAY 06	NO.DPTH 8	WND-DIR 320		WW-CODE 03	
LON 82-000W	HR 08.0	W-COLOR	WND-FCE 04		CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1002.9		CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
080	0000	0620	26611		2095	14649
080	0010	0618	26616		2095	14650
080	0020	0003	28863		2319	14413
080	0030	-0084	29623		2382	14384
080	0049	-0160	31822		2562	14382
080	0074	-0118	32514		2617	14416
080	0098	-0127	32899		2648	14421
080	0118	-0146	33167		2670	14419

C-REF-NO 337	YR 1961	DEPTH 132	WAVES 1	X3	AIR T 07.4	VIS 98
CONS. NO 082	MONTH 8	MXSAMPD 01	WAVES 2	46	WET B 06.2	STN 082
LAT 59-300N	DAY 06	NO.DPTH 8	WND-DIR 270		WW-CODE 02	
LON 82-000W	HR 12.2	W-COLOR 40	WND-FCE 05		CLD-TPE 6	
MARSD SQ 189		W-TRNSP 18	BARO 1005.3		CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
122	0000	0710	25821		2022	14675
122	0010	0745	26217		2049	14696
122	0020	0338	28505		2271	14558
122	0030	-0074	29530		2375	14387
122	0050	-0159	31671		2550	14381
122	0075	-0137	32717		2634	14410
122	0100	-0144	33040		2660	14415
122	0120	-0144	33084		2664	14419



C-REF-NO 337	YR 1961	DEPTH 143	WAVES 1 27X3	AIR T 07.9	VIS 98
CONS. NO 083	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 07.1	STN 083
LAT 58-590N	DAY 06	NO.DPTH 8	WND-DIR 270	WW-CODE 02	
LON 82-000W	HR 15.6	W-COLOR	WND-FCE 06	CLD-TPE 6	
MARSD SQ 189		W-TRNSP	BARO 1006.6	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
156	0000	0830	27241		2118	14741
156	0010	0803	27299		2126	14732
156	0020	-0031	29827		2397	14410
156	0030	-0147	31370		2525	14379
156	0050	-0164	31786		2559	14380
156	0075	-0140	32429		2610	14404
156	0099	-0140	32899		2648	14415
156	0119	-0146	33080		2663	14418

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 177	WAVES 1 X2	AIR T 07.8	VIS 99
CONS. NO 084	MONTH 8	MXSAMPD 02	WAVES 2 46	WET B 06.6	STN 084
LAT 58-350N	DAY 06	NO.DPTH 8	WND-DIR 320	WW-CODE 02	
LON 81-140W	HR 18.9	W-COLOR 50	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP 16	BARO 1005.6	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
189	0000	0800	28298		2205	14742
189	0010	0791	28286		2205	14740
189	0020	-0031	29875		2401	14411
189	0030	-0120	30887		2485	14385
189	0050	-0140	31546		2539	14388
189	0074	-0159	32154		2589	14391
189	0099	-0145	32827		2643	14412
189	0159	-0149	33106		2665	14424

\*TIME-DISTANCE CHECK FAILED



C-REF-NO 337	YR 1961	DEPTH 146	WAVES 1 28X3	AIR T 07.9	VIS 99
CONS. NO 085	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 06.2	STN 085
LAT 58-320N	DAY 07	NO.DPTH 8	WND-DIR 280	WW-CODE	
LON 79-460W	HR 01.0	W-COLOR 30	WND-FCE 04	CLD-TPE 6	
MARSD SQ 188		W-TRNSP 12	BARO 1003.6	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
010	0000	0760	28161		2199	14725
010	0010	0760	28139		2198	14726
010	0020	0089	29512		2367	14461
010	0030	-0028	29972		2409	14415
010	0050	-0138	31024		2497	14381
010	0074	-0154	31607		2544	14386
010	0099	-0145	32325		2602	14404
010	0134	-0139	32697		2632	14418

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 X1	AIR T 04.6	VIS 93
CONS. NO 086	MONTH 8	MXSAMPD 01	WAVES 2 82	WET B 04.3	STN 086
LAT 58-050N	DAY 07	NO.DPTH 7	WND-DIR 090	WW-CODE 02	
LON 79-390W	HR 11.0	W-COLOR 40	WND-FCE 02	CLD-TPE	
MARSD SQ 188		W-TRNSP 11	BARO 999.5	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
110	0000	0280	26965		2153	14509
110	0010	0060	28852		2316	14437
110	0020	0026	29469		2366	14432
110	0030	-0016	29828		2397	14419
110	0049	-0040	30012		2412	14413
110	0074	-0109	31096		2502	14400
110	0098	-0123	31329		2521	14401

C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 10X3	AIR T 06.3	VIS 97
CONS. NO 087	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 05.7	STN 087
LAT 58-140N	DAY 07	NO.DPTH 7	WND-DIR 100	WW-CODE 02	
LON 79-120W	HR 13.0	W-COLOR 30	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP 15	BARO 999.5	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
130	0000	0541	28185		2227	14637
130	0010	0536	28156		2225	14636
130	0020	0297	28905		2306	14546
130	0030	-0055	30295		2436	14407
130	0050	-0118	31039		2498	14391
130	0075	-0134	31379		2525	14392
130	0085	-0136	31436		2530	14394

C-REF-NO 337	YR 1961	DEPTH 46	WAVES 1 12X3	AIR T 06.3	VIS 95
CONS. NO 088	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 05.7	STN 088
LAT 58-170N	DAY 07	NO.DPTH 5	WND-DIR 120	WW-CODE	
LON 78-530W	HR 14.6	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 994.1	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
146	0000	0480	28222		2236	14612
146	0010	0463	28266		2241	14607
146	0020	0233	29580		2364	14527
146	0030	0096	29994		2405	14472
146	0045	0014	30402		2442	14443

C-REF-NO 337 YR 1961 DEPTH 88 WAVES 1 10X3 AIR T 06.8 VIS 96  
 CONS. NO 089 MONTH 8 MXSAMPD 01 WAVES 2 X0 WET B 06.2 STN 089  
 LAT 58-190N DAY 07 NO.DPTH 6 WND-DIR 100 WW-CODE  
 LON 78-320W HR 16.0 W-COLOR WND-FCE 05 CLD-TPE  
 MARSD SQ 188 W-TRNSP BARO 993.1 CLD-AMT 7 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
160	0000	0725	28569		2236	14716
160	0010	0719	28570		2237	14716
160	0020	0516	28930		2288	14639
160	0030	0014	30080		2416	14436
160	0050	-0128	31010		2495	14386
160	0070	-0144	31665		2549	14391

C-REF-NO 337 YR 1961 DEPTH 47 WAVES 1 09X3 AIR T 07.4 VIS 95  
 CONS. NO 090 MONTH 8 MXSAMPD 00 WAVES 2 0942 WET B 06.8 STN 090  
 LAT 58-250N DAY 07 NO.DPTH 4 WND-DIR 100 WW-CODE 21  
 LON 78-170W HR 17.6 W-COLOR WND-FCE 06 CLD-TPE 6  
 MARSD SQ 188 W-TRNSP BARO 989.7 CLD-AMT 8 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
176	0000	0705	24439		1915	14655
176	0010	0656	26635		2093	14665
176	0020	0516	27625		2185	14622
176	0030	0107	29337		2352	14468

C-REF-NO 337	YR 1961	DEPTH 101	WAVES 1 X4	AIR T 06.8	VIS 97
CONS. NO 091	MONTH 8	MXSAMPD 01	WAVES 2 46	WET B 06.2	STN 091
LAT 58-050N	DAY 08	NO.DPTH 7	WND-DIR 270	WW-CODE 03	
LON 77-330W	HR 23.2	W-COLOR 45	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP 10	BARO 1002.2	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
232	0000	0640	24811		1951	14634
232	0010	0634	24792		1950	14632
232	0020	0466	27412		2173	14598
232	0030	0085	29518		2368	14461
232	0050	-0086	30344		2441	14396
232	0075	-0108	30774		2476	14396
232	0100	-0117	31121		2504	14401

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 27X4	AIR T 05.7	VIS 97
CONS. NO 092	MONTH 8	MXSAMPD 01	WAVES 2 2746	WET B 05.1	STN 092
LAT 57-260N	DAY 09	NO.DPTH 7	WND-DIR 270	WW-CODE 02	
LON 77-000W	HR 04.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1006.6	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
042	0000	0638	25814		2030	14646
042	0010	0616	28507		2244	14673
042	0020	0278	29215		2332	14541
042	0030	0021	29680		2384	14434
042	0050	-0081	30217		2430	14397
042	0075	-0094	30415		2447	14398
042	0090	-0094	30447		2449	14401



C-REF-NO 337	YR 1961	DEPTH 80	WAVES 1 23X3	AIR T 08.5	VIS 96
CONS. NO 093	MONTH 8	MXSAMPD 01	WAVES 2 2882	WET B 07.9	STN 093
LAT 56-500N	DAY 09	NO.DPTH 6	WND-DIR 230	WW-CODE	
LON 76-540W	HR 13.7	W-COLOR 60	WND-FCE 03	CLD-TPE	
MARSD SQ 188		W-TRNSP 10	BARO 1010.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
137	0000	0570	23550		1859	14588
137	0010	0573	25195		1988	14612
137	0019	0520	27602		2183	14623
137	0029	0066	28896		2319	14444
137	0048	-0095	30192		2429	14390
137	0072	-0104	30373		2443	14392

C-REF-NO 337	YR 1961	DEPTH 88	WAVES 1 24X3	AIR T 07.1	VIS 96
CONS. NO 094	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 06.5	STN 094
LAT 56-120N	DAY 09	NO.DPTH 6	WND-DIR 220	WW-CODE 55	
LON 77-000W	HR 18.2	W-COLOR 30	WND-FCE 03	CLD-TPE	
MARSD SQ 188		W-TRNSP 14	BARO 1009.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
182	0000	0480	28386		2249	14614
182	0010	0464	28423		2253	14609
182	0019	0433	28610		2271	14600
182	0029	0402	28706		2281	14590
182	0048	0089	29432		2361	14465
182	0072	-0110	30796		2478	14395

C-REF-NO 337	YR 1961	DEPTH 198	WAVES 1 XX	AIR T 05.7	VIS 95
CONS. NO 095	MONTH 8	MXSAMPD 02	WAVES 2 XX	WET B 05.4	STN 095
LAT 55-430N	DAY 09	NO.DPTH 9	WND-DIR 210	WW-CODE	
LON 77-300W	HR 22.1	W-COLOR 35	WND-FCE 01	CLD-TPE	
MARSD SQ 188		W-TRNSP 16	BARO 1008.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
221	0000	0380	18360	807	1464	14439
221	0010	0490	21724	789	1722	14532
221	0020	0336	24071	812	1919	14498
221	0030	0118	28109	795	2253	14457
221	0050	-0054	29809	745	2397	14404
221	0075	-0122	30872	699	2484	14391
221	0100	-0147	31514	882	2537	14392
221	0150	-0148	31807	654	2560	14404
221	0185	-0147	31827	653	2562	14411

C-REF-NO 337	YR 1961	DEPTH 84	WAVES 1 XX	AIR T 08.5	VIS 96
CONS. NO 096	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 07.9	STN 096
LAT 55-210N	DAY 10	NO.DPTH 6	WND-DIR 120	WW-CODE	
LON 77-540W	HR 01.9	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1003.2	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
019	0000	0292	15330	824	1228	14361
019	0010	0316	19820	799	1583	14432
019	0020	0034	24628	846	1978	14369
019	0030	-0135	27877	835	2242	14336
019	0050	-0128	30267	693	2435	14376
019	0075	-0146	31299	702	2519	14386

C-REF-NO 337	YR 1961	DEPTH 172	WAVES 1	XX	AIR T 04.3	VIS 92
CONS. NO 097	MONTH 8	MXSAMPD 02	WAVES 2	42	WET B 04.3	STN 097
LAT 55-240N	DAY 10	NO.DPTH 9	WND-DIR 090		WW-CODE 44	
LON 78-090W	HR 11.1	W-COLOR 60	WND-FCE 01		CLD-TPE	
MARSD SQ 188		W-TRNSP 10	BARO 1002.9		CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
111	0000	0510	20124	787	1595	14519
111	0010	0477	23120	795	1834	14545
111	0020	-0133	27849	848	2240	14335
111	0030	-0129	28797	815	2317	14351
111	0050	-0137	30463	745	2451	14374
111	0075	-0142	31410	695	2528	14389
111	0100	-0149	31673	674	2549	14394
111	0150	-0149	31896	644	2568	14405
111	0160	-0147	31897	639	2568	14408

C-REF-NO 337	YR 1961	DEPTH 139	WAVES 1	XX	AIR T 05.2	VIS 96
CONS. NO 098	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B 04.6	STN 098
LAT 55-310N	DAY 10	NO.DPTH 8	WND-DIR 020		WW-CODE	
LON 78-370W	HR 13.7	W-COLOR 45	WND-FCE 05		CLD-TPE 4	
MARSD SQ 188		W-TRNSP 09	BARO 1003.2		CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
137	0000	0330	23661	814	1887	14487
137	0010	0398	25613	812	2037	14544
137	0020	0033	28227	879	2266	14418
137	0030	0017	29146	800	2341	14425
137	0050	-0122	29996	778	2413	14375
137	0075	-0110	30665	713	2467	14394
137	0100	-0129	31317	693	2520	14398
137	0125	-0136	31459	693	2532	14401

C-REF-NO 337	YR 1961	DEPTH 75	WAVES 1 24X2	AIR T 06.3	VIS 98
CONS. NO 099	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 05.1	STN 099
LAT 55-380N	DAY 10	NO.DPTH 6	WND-DIR 010	WW-CODE	
LON 79-110W	HR 17.0	W-COLOR 50	WND-FCE 03	CLD-TPE 5	
MARSD SQ 188		W-TRNSP 16	BARO 1006.6	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
170	0000	0358	27585	784	2196	14551
170	0010	0343	27596	790	2198	14546
170	0020	0173	27836	821	2229	14476
170	0030	-0098	29006	801	2333	14369
170	0050	-0110	29991	757	2413	14380
170	0065	-0119	30404	728	2446	14384

C-REF-NO 337	YR 1961	DEPTH 150	WAVES 1 24X2	AIR T 07.1	VIS 98
CONS. NO 100	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 06.2	STN 100
LAT 55-180N	DAY 10	NO.DPTH 8	WND-DIR 310	WW-CODE 12	
LON 79-240W	HR 19.5	W-COLOR 40	WND-FCE 03	CLD-TPE	
MARSD SQ 188		W-TRNSP 12	BARO 1008.3	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
195	0000	0290	23974	807	1914	14473
195	0010	0066	26783	856	2149	14412
195	0020	-0140	28410	817	2285	14339
195	0030	-0145	29653	802	2386	14356
195	0050	-0136	30194	777	2430	14371
195	0075	-0120	30993	724	2494	14394
195	0100	-0135	31284	716	2518	14395
195	0140	-0148	31820	653	2561	14403



C-REF-NO 337	YR 1961	DEPTH 88	WAVES 1 X2	AIR T 03.5	VIS 94
CONS. NO 101	MONTH 8	MXSAMPD 01	WAVES 2 3242	WET B 03.2	STN 101
LAT 55-030N	DAY 10	NO.DPTH 7	WND-DIR 310	WW-CODE 03	
LON 79-410W	HR 22.0	W-COLOR 90	WND-FCE 04	CLD-TPE 4	
MARSD SQ 188		W-TRNSP 10	BARO 1011.7	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
220	0000	0420	21450	811	1706	14497
220	0010	0404	21524	812	1713	14493
220	0020	-0013	25883	874	2080	14364
220	0030	-0133		835		
220	0050	-0146	30077	794	2420	14364
220	0075	-0142	30998	733	2495	14383
220	0085	-0140	31176	722	2509	14388

C-REF-NO 337	YR 1961	DEPTH 35	WAVES 1 32X3	AIR T 02.4	VIS 95
CONS. NO 102	MONTH 8	MXSAMPD 00	WAVES 2 3242	WET B 02.3	STN 102
LAT 54-460N	DAY 11	NO.DPTH 4	WND-DIR 320	WW-CODE	
LON 80-000W	HR 01.0	W-COLOR 90	WND-FCE 04	CLD-TPE 4	
MARSD SQ 189		W-TRNSP 08	BARO 1014.1	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
010	0000	0580	22545	789	1779	14579
010	0010	0548	22709	745	1795	14570
010	0020	0229	24265	795	1941	14453
010	0025	0008	25974	800	2086	14376

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 32X2	AIR T 02.9	VIS 95
CUNS. NO 103	MONTH 8	MXSAMPD 01	WAVES 2 XO	WET B 02.9	STN 103
LAT 54-460N	DAY 11	NO.DPTH 7	WND-DIR 320	WW-CODE 47	
LON 80-240W	HR 03.4	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1014.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
034	0000	0441	21639	794	1719	14509
034	0010	0489	21705	800	1721	14532
034	0020	0027	26341	846	2115	14389
034	0030	-0142	28895	825	2325	14346
034	0050	-0142	30079	784	2420	14366
034	0075	-0144	31206	718	2512	14385
034	0090	-0148	31815	652	2561	14394

C-REF-NO 337	YR 1961	DEPTH 89	WAVES 1 30X3	AIR T 02.4	VIS 94
CUNS. NO 104	MONTH 8	MXSAMPD 01	WAVES 2 XO	WET B 02.3	STN 104
LAT 54-460N	DAY 11	NO.DPTH 6	WND-DIR 300	WW-CODE 47	
LON 80-580W	HR 06.1	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1014.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
061	0000	0370	19800	795	1579	14454
061	0010	0238	22346	856	1788	14430
061	0020	0102	27954	875	2242	14446
061	0030	-0149	30236	862	2433	14362
3 061	0050	-0159	31119	805	2505	14373
3 061	0080	-0158	30851	805	2483	14375

C-REF-NO 337	YR 1961	DEPTH 42	WAVES 1 X1	AIR T 03.5	VIS 98
CONS. NO 105	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 03.4	STN 105
LAT 54-460N	DAY 11	NO.DPTH 4	WND-DIR 300	WW-CODE 01	
LON 81-320W	HR 09.3	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1016.4	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
093	0000	0340	24345	797	1941	14500
093	0010	0139	28497	844	2283	14468
093	0020	0090	28836	846	2313	14452
093	0030	-0111	29047	794	2336	14363

C-REF-NO 337	YR 1961	DEPTH 18	WAVES 1 00X0	AIR T 04.1	VIS 98
CONS. NO 106	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 03.8	STN 106
LAT 54-490N	DAY 11	NO.DPTH 2	WND-DIR CALM	WW-CODE 01	
LON 81-540W	HR 11.4	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1016.4	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
114	0000	0405	27749	796	2205	14574
114	0010	0367	27846	800	2216	14560

C-REF-NO 337	YR 1961	DEPTH 26	WAVES 1 XX	AIR T 04.1	VIS 96
CONS. NO 107	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 02.9	STN 107
LAT 55-100N	DAY 11	NO.DPTH 3	WND-DIR 150	WW-CODE 01	
LON 81-560W	HR 14.3	W-COLOR 50	WND-FCE 01	CLD-TPE	
MARSD SQ 189		W-TRNSP 12	BARO 1015.4	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
143	0000	0136	26507	834	2124	14438
143	0010	0190	28172	834	2255	14487
143	0018	0088	28492	813	2285	14446

C-REF-NO 337	YR 1961	DEPTH 58	WAVES 1 XX	AIR T 03.5	VIS 96
CONS. NO 108	MONTH 8	MXSAMPD 00	WAVES 2 XX	WET B 02.9	STN 108
LAT 55-275N	DAY 11	NO.DPTH 5	WND-DIR 150	WW-CODE	
LON 82-020W	HR 16.7	W-COLOR 50	WND-FCE 01	CLD-TPE 3	
MARSD SQ 189		W-TRNSP 18	BARO 1013.4	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
167	0000	0070	25167	863	2020	14390
167	0010	0039	26561	846	2133	14396
167	0020	-0121	30535	860	2457	14378
167	0030	-0148	31240	756	2514	14376
167	0050	-0149	31386	733	2526	14381



C-REF-NO 337	YR 1961	DEPTH 93	WAVES 1 X1	AIR T 02.8	VIS 98
CONS. NO 109	MONTH 8	MXSAMPD 01	WAVES 2 42	WET B 02.3	STN 109
LAT 55-470N	DAY 11	NO.DPTH 7	WND-DIR 120	WW-CODE 03	
LON 81-560W	HR 21.4	W-COLOR 50	WND-FCE 01	CLD-TPE 3	
MARSD SQ 189		W-TRNSP 15	BARO 1010.7	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
214	0000	0070	23836	878	1913	14372
214	0010	-0088	27096	909	2179	14344
214	0020	-0139	30064	902	2419	14363
214	0030	-0156	30604	825	2463	14364
214	0050	-0165	31376	817	2526	14374
214	0075	-0151	32345	632	2604	14398
214	0085	-0151		624		

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 XX	AIR T 03.5	VIS 99
CONS. NO 110	MONTH 8	MXSAMPD 01	WAVES 2 0942	WET B 02.9	STN 110
LAT 56-205N	DAY 12	NO.DPTH 8	WND-DIR 110	WW-CODE 03	
LON 81-280W	HR 02.0	W-COLOR 00	WND-FCE 03	CLD-TPE 3	
MARSD SQ 189		W-TRNSP	BARO 1011.4	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
020	0000	0250	24624	835	1968	14464
020	0010	0040	26475	877	2126	14395
020	0020	-0108	29909	868	2406	14375
020	0030	-0127	30622	902	2464	14378
020	0049	-0160	31222	835	2513	14374
020	0074	-0156	32105	692	2585	14392
020	0098	-0144	32747	566	2636	14411
020	0108	-0148	32999	514	2657	14414

C-REF-NO 337	YR 1961	DEPTH 150	WAVES 1	X0	AIR T 03.9	VIS 97
CONS. NO 111	MONTH 8	MXSAMPD 01	WAVES 2	X0	WET B 03.2	STN 111
LAT 57-000N	DAY 12	NO.DPTH 8	WND-DIR	050	WW-CODE 02	
LON 80-560W	HR 07.4	W-COLOR	WND-FCE	01	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1010.0		CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
074	0000	0240	24565	857	1964	14459
074	0010	0074	25064	892	2011	14392
074	0020	-0118	29709	892	2390	14368
074	0030	-0146	30307	764	2439	14364
074	0050	-0158	30851	824	2483	14370
074	0075	-0162	31503	784	2536	14381
074	0100	-0148	32511	601	2617	14406
074	0140	-0144	32940	485	2652	14420

C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1	X0	AIR T 05.7	VIS 99
CONS. NO 112	MONTH 8	MXSAMPD 01	WAVES 2	3242	WET B 04.6	STN 112
LAT 58-035N	DAY 12	NO.DPTH 8	WND-DIR	220	WW-CODE 02	
LON 80-440W	HR 14.1	W-COLOR 30	WND-FCE	01	CLD-TPE 3	
MARSD SQ 189		W-TRNSP 18	BARO 1011.4		CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
141	0000	0556	27220	769	2149	14630
141	0010	0532	27543	778	2177	14626
141	0020	-0069	30600	886	2461	14403
141	0030	-0121	31089	839	2502	14387
141	0050	-0159	31179	807	2510	14374
141	0075	-0144	32460	599	2613	14403
141	0099	-0140	32790	494	2640	14413
141	0104	-0140	32799	508	2640	14414

TIME-DISTANCE CHECK FAILED

C-REF-NO 337 YR 1961 DEPTH 165 WAVES 1 X2 AIR T 06.1 VIS 93  
 CONS. NO 113 MONTH 8 MXSAMPD 02 WAVES 2 42 WET B 05.2 STN 113  
 LAT 58-030N DAY 12 NO.DPTH 9 WND-DIR 270 WW-CODE 03  
 LON 82-310W HR 21.2 W-COLOR WND-FCE 04 CLD-TPE 3  
 MARSD SQ 189 W-TRNSP BARO 1011.4 CLD-AMT 5 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
212	0000	0730	28198	718	2206	14714
212	0010	0741	28239	713	2208	14720
212	0020	-0038	31135	890	2503	14425
212	0030	-0121	31588	857	2542	14394
212	0049	-0156	31814	875	2561	14384
212	0074	-0163	32167	593	2590	14390
212	0099	-0146	32948	464	2653	14413
212	0148	-0150	33203	469	2673	14423
212	0158	-0150	33214	448	2674	14424

C-REF-NO 337 YR 1961 DEPTH 176 WAVES 1 26X3 AIR T 05.4 VIS 93  
 CONS. NO 114 MONTH 8 MXSAMPD 01 WAVES 2 X0 WET B 05.1 STN 114  
 LAT 57-240N DAY 13 NO.DPTH 8 WND-DIR 260 WW-CODE 02  
 LON 83-070W HR 02.8 W-COLOR WND-FCE 04 CLD-TPE  
 MARSD SQ 189 W-TRNSP BARO 1011.4 CLD-AMT 8 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
028	0000	0570	26571	763	2097	14628
028	0010	0490	26695	765	2114	14597
028	0020	-0046	30706	907	2469	14415
028	0030	-0094	31420	881	2528	14404
028	0050	-0155	31708	849	2552	14383
028	0075	-0152	32447	632	2612	14399
028	0100	-0148	32991	557	2656	14413
028	0150	-0150	33192	459	2672	14423

C-REF-NO 337	YR 1961	DEPTH 168	WAVES 1 X3	AIR T 04.4	VIS 93
CONS. NO 115	MONTH 8	MXSAMPD 02	WAVES 2 82	WET B 04.4	STN 115
LAT 56-530N	DAY 13	NO.DPTH 9	WND-DIR 290	WW-CODE 03	
LON 83-360W	HR 07.0	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1011.4	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
070	0000	0470	26247	778	2081	14581
070	0010	0368	26582	814	2116	14544
070	0020	-0050	30604	956	2461	14412
070	0030	-0126	31060	912	2499	14384
070	0050	-0162	31607	834	2544	14378
070	0075	-0155	32316	671	2602	14396
070	0100	-0147	32937	607	2652	14412
070	0150	-0148	33190	473	2672	14424
070	0160	-0150	33235	474	2676	14425

C-REF-NO 337	YR 1961	DEPTH 144	WAVES 1 X1	AIR T 02.7	VIS 92
CONS. NO 116	MONTH 8	MXSAMPD 01	WAVES 2 42	WET B 02.3	STN 116
LAT 56-220N	DAY 13	NO.DPTH 8	WND-DIR 290	WW-CODE 01	
LON 84-040W	HR 11.2	W-COLOR 20	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP 17	BARO 1014.7	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
112	0000	0290	22744	825	1817	14457
112	0010	-0034	29660	932	2384	14405
112	0020	-0098	30745	928	2473	14391
112	0030	-0145	31248	874	2515	14378
112	0050	-0164	31670	824	2550	14378
112	0074	-0154	32359	657	2605	14397
112	0099	-0149	32890	571	2648	14411
112	0129	-0148	33111	498	2666	14419



C-REF-NO 337 YR 1961 DEPTH 95 WAVES 1 XX AIR T 01.3 VIS 99  
 CONS. NO 117 MONTH 8 MXSAMPD 01 WAVES 2 XX WET B 00.7 STN 117  
 LAT 56-020N DAY 13 NO.DPTH 7 WND-DIR 280 WW-CODE 01  
 LON 84-210W HR 14.6 W-COLOR 50 WND-FCE 03 CLD-TPE  
 MARSD SQ 189 W-TRNSP 16 BARO 1016.8 CLD-AMT 2 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
146	0000	0065	20149	877	1618	14320
146	0010	-0032	27157	922	2182	14371
146	0020	-0122	30800	914	2478	14381
146	0030	-0140	31069	897	2500	14378
146	0050	-0162	31499	824	2536	14377
146	0075	-0157	32177	672	2590	14393
146	0085	-0151	32750	551	2637	14405

C-REF-NO 337 YR 1961 DEPTH 48 WAVES 1 XO AIR T 03.6 VIS 98  
 CONS. NO 118 MONTH 8 MXSAMPD 00 WAVES 2 XO WET B 02.5 STN 118  
 LAT 55-390N DAY 13 NO.DPTH 5 WND-DIR 280 WW-CODE 01  
 LON 84-550W HR 17.6 W-COLOR 50 WND-FCE 01 CLD-TPE 4  
 MARSD SQ 189 W-TRNSP 25 BARO 1016.8 CLD-AMT 2 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
176	0000	0298	22719	825	1814	14460
176	0010	0246	27308	841	2182	14500
176	0020	-0106	31126	902	2504	14393
176	0030	-0155	31555	765	2540	14378
176	0040	-0156	31558	765	2540	14379

TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 16	WAVES 1 X0	AIR T 06.8	VIS 99
CONS. NO 119	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 05.4	STN 119
LAT 55-270N	DAY 13	NO.DPTH 3	WND-DIR 130	WW-CODE 02	
LON 84-590W	HR 19.9	W-COLOR 50	WND-FCE 01	CLD-TPE 4	
MARSD SQ 189		W-TRNSP 15	BARO 1013.7	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
199	0000	0280	23457	795	1874	14462
199	0010	0163	27508	834	2203	14466
199	0015	0100	29314	881	2351	14462

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 X2	AIR T 04.3	VIS 93
CONS. NO 120	MONTH 8	MXSAMPD 01	WAVES 2 82	WET B 04.1	STN 120
LAT 56-525N	DAY 14	NO.DPTH 8	WND-DIR 300	WW-CODE 02	
LON 85-050W	HR 18.4	W-COLOR	WND-FCE 04	CLD-TPE 4	
MARSD SQ 189		W-TRNSP	BARO 993.1	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
184	0000	0252	24351	834	1947	14461
184	0010	0130	25049	867	2008	14417
184	0020	-0068	30820	907	2478	14407
184	0030	-0115	30969	937	2492	14388
184	0050		31073	917		
184	0075		31768	834		
184	0100		32446	658		
184	0120		32815	577		

C-REF-NO 337	YR 1961	DEPTH 93	WAVES 1 28X3	AIR T 04.4	VIS 93
CONS. NO 121	MONTH 8	MXSAMPD 01	WAVES 2 2882	WET B 04.1	STN 121
LAT 57-260N	DAY 15	NO.DPTH 7	WND-DIR 280	WW-CODE	
LON 85-380W	HR 01.1	W-COLOR 40	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP 14	BARO 995.4	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
011	0000	0196	25487	842	2040	14452
011	0010	0182	25607	844	2050	14449
011	0020	-0143	30866	905	2484	14372
011	0030	-0156	31058	876	2500	14370
011	0049	-0162	31498	808	2536	14377
011	0075	-0158	32275	679	2598	14394
011	0085	-0154	32465	642	2614	14400

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 X3	AIR T 07.1	VIS 97
CONS. NO 122	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B 06.4	STN 122
LAT 57-520N	DAY 15	NO.DPTH 7	WND-DIR 140	WW-CODE 59	
LON 86-400W	HR 07.3	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1004.6	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
073	0000	0460	25823	762	2048	14572
073	0010	0432	26026	797	2067	14564
073	0020	-0104	31217	846	2512	14395
073	0030	-0151	31757	864	2556	14382
073	0050	-0162	31915	846	2569	14383
073	0075	-0166	32114	762	2586	14388
073	0100	-0154	32708	628	2633	14406

C-REF-NO 337	YR 1961	DEPTH 165	WAVES 1 36X4	AIR T 05.7	VIS 97
CONS. NO 123	MONTH 8	MXSAMPD 01	WAVES 2 0426	WET B 05.1	STN 123
LAT 58-130N	DAY 15	NO.DPTH 8	WND-DIR 360	WW-CODE 02	
LON 87-300W	HR 12.3	W-COLOR 55	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP 13	BARO 1014.1	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
123	0000	0420	26602	789	2113	14565
123	0010	0418	26593	796	2113	14565
123	0020	-0050	30604	930	2461	14412
123	0030	-0113	31337	908	2521	14394
123	0050	-0159	31923	816	2570	14384
123	0075	-0168	32116	753	2586	14387
123	0100	-0154	32762	629	2638	14407
123	0145	-0152	33161	543	2670	14421

C-REF-NO 337	YR 1961	DEPTH 157	WAVES 1 31X2	AIR T 04.1	VIS 95
CONS. NO 124	MONTH 8	MXSAMPD 01	WAVES 2 0982	WET B 03.4	STN 124
LAT 58-390N	DAY 15	NO.DPTH 8	WND-DIR 310	WW-CODE 10	
LON 88-300W	HR 17.9	W-COLOR 30	WND-FCE 03	CLD-TPE 4	
MARSD SQ 189		W-TRNSP 15	BARO 1018.8	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
179	0000	0340	25797	808	2056	14520
179	0010	0354	25926	813	2065	14529
179	0020	-0082	30953	947	2490	14402
179	0030	-0132	31581	876	2542	14389
179	0050	-0166	31954	849	2573	14381
179	0075	-0165	32156	772	2589	14389
179	0100	-0160	32526	664	2619	14400
179	0140	-0152	33111	530	2666	14419



C-REF-NO 337 YR 1961 DEPTH 124 WAVES 1 X1 AIR T 01.6 VIS 91  
 CONS. NO 125 MONTH 8 MXSAMPD 01 WAVES 2 26 WET B 01.5 STN 125  
 LAT 59-020N DAY 15 NO.DPTH 8 WND-DIR 230 WW-CODE  
 LON 89-200W HR 22.4 W-COLOR 20 WND-FCE 02 CLD-TPE  
 MARSD SQ 189 W-TRNSP 14 BARO 1017.1 CLD-AMT 7 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
224	0000	0058	22898	860	1838	14353
224	0010	-0002	27938	878	2244	14396
224	0020	-0101	30711	938	2471	14390
224	0030	-0132	31514	883	2536	14388
224	0050	-0163	31987	789	2575	14383
224	0075	-0162	32364	688	2606	14393
224	0100	-0151	33052	558	2661	14412
224	0115	-0151	33079	543	2663	14415

C-REF-NO 337 YR 1961 DEPTH 146 WAVES 1 17X2 AIR T 06.8 VIS 96  
 CONS. NO 126 MONTH 8 MXSAMPD 01 WAVES 2 X0 WET B 06.2 STN 126  
 LAT 59-300N DAY 16 NO.DPTH 8 WND-DIR 170 WW-CODE  
 LON 90-280W HR 03.0 W-COLOR WND-FCE 05 CLD-TPE  
 MARSD SQ 190 W-TRNSP BARO 1011.4 CLD-AMT 8 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
030	0000	0616	27316	752	2150	14656
030	0010	0597	27400	776	2159	14651
030	0020	-0050	31075	969	2498	14419
030	0030	-0120	31556	885	2539	14394
030	0050	-0162	32176	740	2590	14386
030	0075	-0156	32679	653	2631	14400
030	0100	-0151	32951	608	2653	14411
030	0125	-0150	33052	548	2661	14417

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH		WAVES 1	XX	AIR T		VIS
CONS. NO 127	MONTH 8	MXSAMPD	00	WAVES 2	XX	WET B		STN 127
LAT 60-250N	DAY 19	NO.DPTH	1	WND-DIR	220	WW-CODE		
LON 93-390W	HR 01.1	W-COLOR		WND-FCE	01	CLD-TPE		
MARSD SQ 226		W-TRNSP		BARO	1014.7	CLD-AMT		HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
011	0000					

Camera lowering only.

C-REF-NO 337	YR 1961	DEPTH	183	WAVES 1	XX	AIR T	04.4	VIS	99
CONS. NO 128	MONTH 8	MXSAMPD	02	WAVES 2	XX	WET B	03.9	STN	128
LAT 58-565N	DAY 21	NO.DPTH	9	WND-DIR	220	WW-CODE			
LON 88-000W	HR 05.3	W-COLOR		WND-FCE	03	CLD-TPE			
MARSD SQ 189		W-TRNSP		BARO	1013.4	CLD-AMT	2	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
053	0000	0529	27067	801	2140	14617
053	0010	0509	27121	759	2146	14611
053	0020	-0072	30876	932	2483	14406
053	0030	-0144	31676	851	2550	14384
053	0050	-0163	31997	775	2576	14383
053	0075	-0154	32615	647	2626	14400
053	0100	-0147	32989	588	2656	14413
053	0150	-0150	33212	527	2674	14423
053	0169	-0152	33239	506	2676	14426

C-REF-NO 337 YR 1961 DEPTH 102 WAVES 1 22X3 AIR T 08.1 VIS 97  
 CONS. NO 129 MONTH 8 MXSAMPD 01 WAVES 2 X0 WET B 07.5 STN 129  
 LAT 58-415N DAY 21 NO.DPTH 7 WND-DIR 220 WW-CODE 02  
 LON 84-440W HR 16.8 W-COLOR WND-FCE 05 CLD-TPE  
 MARSD SQ 189 W-TRNSP BARO 1008.0 CLD-AMT 8 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
168	0000	0688	27326	709	2145	14677
168	0010	0658	27331	738	2147	14675
168	0020	-0067	31356	903	2522	14415
168	0030	-0131	31742	857	2555	14392
168	0050	-0158	32216	771	2594	14389
168	0075	-0149	32846	628	2644	14406
168	0090	-0148	33010	512	2658	14411

C-REF-NO 337 YR 1961 DEPTH 190 WAVES 1 X2 AIR T 08.5 VIS 98  
 CONS. NO 130 MONTH 8 MXSAMPD 02 WAVES 2 42 WET B 07.3 STN 130  
 LAT 58-415N DAY 21 NO.DPTH 9 WND-DIR 230 WW-CODE 02  
 LON 83-250W HR 21.0 W-COLOR 55 WND-FCE 06 CLD-TPE  
 MARSD SQ 189 W-TRNSP 15 BARO 1005.9 CLD-AMT 6 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
210	0000	0652	27281	731	2144	14670
210	0010	0649	27228	732	2140	14670
210	0020	0021	31189	912	2505	14453
210	0030	-0120	31800	868	2559	14398
210	0050	-0162	31987	827	2575	14384
210	0075	-0169	32500	661	2617	14396
210	0100	-0146	32978	623	2655	14413
210	0150	-0149	33175	497	2671	14423
210	0165	-0149	33219	444	2675	14426

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 161	WAVES 1 X1	AIR T 07.4	VIS 98
CONS. NO 131	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B 05.7	STN 131
LAT 58-370N	DAY 22	NO. DPTH 8	WND-DIR 300	WW-CODE 02	
LON 79-280W	HR 11.8	W-COLOR 50	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP 13	BARO 1003.9	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	0629	28055	739	2207	14671
118	0010	0624	28065	791	2208	14671
118	0020	0276	28880	801	2305	14536
118	0030	-0041	30131	831	2422	14411
118	0050	-0145	31156	668	2508	14380
118	0075	-0152	31174	721	2509	14381
118	0100	-0143	32358	577	2605	14406
118	0149	-0138	32708	502	2633	14421

C-REF-NO 337	YR 1961	DEPTH 157	WAVES 1 29X4	AIR T 07.8	VIS 98
CONS. NO 132	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 07.8	STN 132
LAT 58-380N	DAY 22	NO. DPTH 8	WND-DIR 290	WW-CODE 02	
LON 79-080W	HR 13.4	W-COLOR 50	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP 10	BARO 1003.9	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
134	0000	0759	25685	721	2006	14693
134	0010	0756	25703	730	2008	14693
134	0020	0336	29036	806	2313	14564
134	0030	-0038	30126	831	2422	14413
134	0050	-0106	31006	694	2495	14396
134	0075	-0151	31647	729	2547	14388
134	0099	-0144	32406	576	2609	14406
134	0139	-0139	32622	526	2626	14418



C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 29X4	AIR T 07.8	VIS 98
CONS. NO 133	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 06.1	STN 133
LAT 58-370N	DAY 22	NO. DPTH 6	WND-DIR 290	WW-CODE 02	
LOH 78-520W	HR 14.8	W-COLOR 50	WND-FCE 06	CLD-TPE	
MARSD SQ 188		W-TRNSP 11	BARO 1004.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
148	0000	0715	26774	718	2097	14689
148	0010	0708	26809	723	2100	14688
148	0020	0465	28888	765	2290	14617
148	0030	0006	29904	740	2402	14430
148	0050	-0090	30697	704	2469	14400
148	0075	-0109	31225	678	2512	14402

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 27X6	AIR T 04.4	VIS 98
CONS. NO 134	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B 03.9	STN 134
LAT 60-000N	DAY 23	NO. DPTH 7	WND-DIR 270	WW-CODE 02	
LOH 79-540W	HR 03.7	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1010.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
037	0000	0682	28835	743	2262	14703
037	0010	0684	28824	715	2261	14705
037	0020	0684	28824	710	2261	14707
037	0030	0061	29427	862	2362	14449
037	0050			598		
037	0075	-0122	32456		2612	14413
037	0100	-0122	32767	558	2637	14422

C-REF-NO 337	YR 1961	DEPTH 148	WAVES 1	X1	AIR T 06.7	VIS 98
CONS. NO 135	MONTH 8	MXSAMPD 01	WAVES 2	26	WET B 05.3	STN 135
LAT 60-430N	DAY 23	NO.DPTH 8	WND-DIR 280		WW-CODE 02	
LON 79-250W	HR 09.9	W-COLOR	WND-FCE 05		CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1009.3		CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
099	0000	0660	29066	711	2283	14697
099	0010	0653	29057	718	2283	14696
099	0020	0651	29053	718	2283	14696
099	0030	-0084	31094	802	2501	14405
099	0050	-0116	32108	661	2584	14407
099	0075	-0110	32709	637	2632	14422
099	0100	-0111	32845	661	2643	14428
099	0140	-0141	32982	516	2655	14422

C-REF-NO 337	YR 1961	DEPTH 121	WAVES 1	X1	AIR T 06.9	VIS 98
CONS. NO 136	MONTH 8	MXSAMPD 01	WAVES 2	82	WET B 04.8	STN 136
LAT 60-430N	DAY 23	NO.DPTH 8	WND-DIR 270		WW-CODE 02	
LON 79-050W	HR 11.8	W-COLOR 50	WND-FCE 04		CLD-TPE	
MARSD SQ 224		W-TRNSP 13	BARO 1009.0		CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	0630	28839	725	2269	14682
118	0010	0636	28832	704	2267	14686
118	0020	0634	28820	678	2267	14686
118	0030	-0067	30393	699	2444	14403
118	0049	-0117	31910	487	2568	14404
118	0074	-0124	32563	442	2621	14414
118	0098	-0128	32871	289	2646	14420
118	0108	-0135	32898	374	2648	14419

C-REF-NO 337	YR 1961	DEPTH 73	WAVES 1 27X2	AIR T 06.1	VIS 98
CONS. NO 137	MONTH 8	MXSAMPD 01	WAVES 2 82	WET B 05.6	STN 137
LAT 60-430N	DAY 23	NO.DPTH 6	WND-DIR 270	WW-CODE 02	
LON 78-470W	HR 13.6	W-COLOR 50	WND-FCE 05	CLD-TPE	
MARSD SQ 224		W-TRNSP 12	BARO 1008.6	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
136	0000	0689	28278	699	2218	14698
136	0010	0689	28260	715	2216	14700
136	0020	0669	28309	719	2222	14694
136	0029	0096	29760	770	2387	14469
136	0049	-0139	31198	704	2511	14383
136	0064	-0148	31441	740	2531	14385

C-REF-NO 337	YR 1961	DEPTH 113	WAVES 1 00X0	AIR T 06.8	VIS 98
CONS. NO 138	MONTH 8	MXSAMPD 01	WAVES 2 42	WET B 06.2	STN 138
LAT 61-010N	DAY 23	NO.DPTH 7	WND-DIR CALM	WW-CODE 02	
LON 80-470W	HR 22.3	W-COLOR 50	WND-FCE 00	CLD-TPE	
MARSD SQ 225		W-TRNSP 16	BARO 1006.3	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
223	0000	0630	29690	701	2335	14693
223	0010	0630	29679	721	2335	14694
223	0020	0623	29672	720	2335	14693
223	0030	-0097	30764	856	2475	14394
223	0050	-0127	32016	650	2577	14401
223	0075	-0114	32736	603	2635	14421
223	0100	-0117	32999	582	2656	14427

C-REF-NO 337	YR 1961	DEPTH 121	WAVES 1	XO	AIR T 06.1	VIS 98
CONS. NO 139	MONTH 8	MXSAMPD 01	WAVES 2	XO	WET B 05.6	STN 139
LAT 61-260N	DAY 24	NO.DPTH 7	WND-DIR 220		WW-CODE 01	
LON 80-470W	HR 03.1	W-COLOR	WND-FCE 01		CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1009.3		CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
031	0000	0600	29696	719	2339	14681
031	0010	0599	29720	719	2341	14682
031	0020	0603	29761	739	2344	14686
031	0030	-0097	31049	812	2498	14398
031	0050	-0110	32118	679	2585	14410
031	0075	-0113	32652	624	2628	14420
031	0100	-0114	32953	603	2652	14428

C-REF-NO 337	YR 1961	DEPTH 62	WAVES 1	X1	AIR T 02.5	VIS 98
CONS. NO 140	MONTH 8	MXSAMPD 01	WAVES 2	XO	WET B 02.2	STN 140
LAT 61-280N	DAY 24	NO.DPTH 6	WND-DIR 090		WW-CODE 02	
LON 78-080W	HR 11.7	W-COLOR	WND-FCE 03		CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1012.0		CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
117	0000	0653	29097	699	2286	14694
117	0010	0601	29130	659	2295	14675
117	0020	0497	29346	722	2323	14637
117	0030	0437	29524	712	2343	14616
117	0049	-0050	30664	633	2465	14418
117	0059	-0083	30920	511	2487	14407



C-REF-NO 337	YR 1961	DEPTH 44	WAVES 1 02X2	AIR T 05.7	VIS 99
CONS. NO 141	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B 05.4	STN 141
LAT 62-000N	DAY 24	NO. DPTH 5	WND-DIR 020	WW-CODE 01	
LON 78-170W	HR 15.4	W-COLOR 50	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP 10	BARO 1012.7	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
154	0000	0719	29022	694	2272	14720
154	0010	0686	29067	701	2280	14709
154	0020	0641	29190	705	2295	14694
154	0030	0131	30108	739	2413	14490
154	0040	0117	30193	729	2420	14486

C-REF-NO 337	YR 1961	DEPTH 172	WAVES 1 03X3	AIR T 04.9	VIS 99
CONS. NO 142	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B 04.0	STN 142
LAT 62-000N	DAY 24	NO. DPTH 8	WND-DIR 030	WW-CODE 01	
LON 78-400W	HR 17.0	W-COLOR 50	WND-FCE 05	CLD-TPE	
MARSD SQ 224		W-TRNSP 17	BARO 1012.0	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
170	0000	0600	29234	712	2303	14675
170	0010	0596	29227	717	2303	14675
170	0020	0589	29230	721	2304	14673
170	0030	-0049	30273	796	2434	14410
170	0050	-0129	31456	610	2531	14392
170	0075	-0116	32271	690	2597	14413
170	0100	-0084	32905	711	2647	14441
170	0135	-0081	32978		2653	14450

C-REF-NO 337	YR 1961	DEPTH 144	WAVES 1	X1	AIR T 06.4	VIS 98
CONS. NO 143	MONTH 8	MXSAMPD 01	WAVES 2	42	WET B 05.6	STN 143
LAT 62-000N	DAY 24	NO.DPTH 5	WND-DIR	030	WW-CODE 01	
LON 79-010W	HR 18.9	W-COLOR	WND-FCE	04	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1011.7		CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
189	0000	0560	29699	719	2344	14664
189	0010	0553	29700	721	2345	14663
189	0020	0484	30620	735	2430	14627
189	0030	0350	30865	753	2456	14600
189	0050	0080	31905	750	2567	14417
189	0075	0086	32727	760	2633	14434
189	0100	0084	32906	750	2647	14441
189	0135	0077	32994	760	2654	14452

C-REF-NO 337	YR 1961	DEPTH 144	WAVES 1	X1	AIR T 05.7	VIS 98
CONS. NO 144	MONTH 8	MXSAMPD 01	WAVES 2	42	WET B 04.0	STN 144
LAT 62-000N	DAY 24	NO.DPTH 5	WND-DIR	030	WW-CODE 02	
LON 79-150W	HR 20.1	W-COLOR	WND-FCE	04	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1011.4		CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
201	0000	0465	30400	745	2410	14634
201	0010	0504	30380	749	2404	14652
201	0020	0495	30404	744	2407	14650
201	0030	0403	30689	754	2438	14617
201	0050	0074	31912	736	2567	14424
201	0075	0083	32734	743	2633	14435

C-REF-NO 337	YR 1961	DEPTH 329	WAVES 1 XX	AIR T	VIS 99
CONS. NO 145	MONTH 8	MXSAMPD 03	WAVES 2 XX	WET B	STN 145
LAT 62-380N	DAY 25	NO.DPTH 11	WND-DIR 030	WW-CODE	
LON 79-360W	HR 01.1	W-COLOR 35	WND-FCE 04	CLD-TPE	
MARSD SQ 224		W-TRNSP 15	BARO 1012.0	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
011	0000	0704	31566	831	2317	14431
011	0010	0678	31541	801	2321	14572
011	0020	0736	31642	817	2326	14336
011	0030	0684	32645	822	2336	14436
011	0050	0692	32710	751	2332	14427
011	0075	0697	32671	761	2345	14435
011	0100	0687	32942	751	2350	14441
011	0150	0687	33067	729	2662	14450
011	0200	0696	33142	724	2656	14460
011	0250	0679	33177	722	2669	14478
011	0300	0679	33190	729	2664	14481

C-REF-NO 337	YR 1961	DEPTH 485	WAVES 1 XX	AIR T 03.9	VIS 99
CONS. NO 146	MONTH 8	MXSAMPD 05	WAVES 2 XX	WET B	STN 146
LAT 62-380N	DAY 25	NO.DPTH 13	WND-DIR 040	WW-CODE 02	
LON 79-000W	HR 07.2	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1014.1	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
072	0000	0425	39923	761	2376	14611
072	0010	0233	30413	725	2431	14530
072	0020	0115	30899	785	2477	14492
072	0030	0085	31271	666	2508	14483
072	0050	0050	31873	710	2563	14435
072	0075	0043	32332	715	2600	14448
072	0100	0062	32707	690	2631	14449
072	0150	0068	33054	729	2659	14459
072	0200	0076	33154	725	2667	14465
072	0250	0080	33232	725	2674	14473
072	0300	0080	33267	715	2676	14481
072	0400	0081	33282	697	2678	14498
072	0469	0078		715		

C-REF-NO 337	YR 1961	DEPTH 446	WAVES 1 XX	AIR T 02.2	VIS 99
CONS. NO 147	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B	STN 147
LAT 62-460N	DAY 25	NO.DPTH 8	WND-DIR 040	WW-CODE 01	
LON 78-000W	HR 08.9	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1016.4	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
089	0000	0140	32464		2601	14521
089	0010	0123	32470		2602	14515
089	0020	0111	32492		2605	14512
089	0030	0081	32611		2616	14502
089	0050	0030	32750		2630	14484
089	0075	-0013	32852		2640	14469
089	0100	-0058	32980		2652	14455
089	0150	-0071	33108		2663	14459

C-REF-NO 337	YR 1961	DEPTH 165	WAVES 1 XX	AIR T 02.2	VIS 99
CONS. NO 148	MONTH 8	MXSAMPD 01	WAVES 2 XX	WET B	STN 148
LAT 62-580N	DAY 25	NO.DPTH 8	WND-DIR 040	WW-CODE 01	
LON 78-000W	HR 11.2	W-COLOR 50	WND-FCE 02	CLD-TPE	
MARSD SQ 224		W-TRNSP 22	BARO 1017.4	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
112	0000	0050	32692	802	2624	14484
112	0010	0048	32694	792	2625	14485
112	0020	0040	32723	783	2627	14483
112	0030	0028	32790	781	2633	14480
112	0050	0001	32891	778	2643	14472
112	0075	-0007	32933	784	2646	14473
112	0100	-0013	32943	772	2648	14475
112	0150	-0026	32958	770	2649	14477



C-REF-NO 337	YR 1961	DEPTH 66	WAVES 1 00X0	AIR T 03.3	VIS 99
CONS. NO 149	MONTH 8	MXSAMPD 00	WAVES 2 XO	WET B	STN 149
LAT 63-040N	DAY 25	NO.DPTH 5	WND-DIR CALM	WW-CODE 02	
LON 78-000W	HR 12.8	W-COLOR 50	WND-FCE 00	CLD-TPE	
MARSD SQ 224		W-TRNSP 20	BARO 1017.8	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
128	0000	0080	32658	807	2620	14497
128	0010	0068	32669	801	2621	14493
128	0020	0048	32707	793	2626	14486
128	0030	0048	32711	793	2626	14488
128	0050	0040	32731	791	2628	14488

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 00X0	AIR T 06.1	VIS 99
CONS. NO 150	MONTH 8	MXSAMPD 00	WAVES 2 XO	WET B	STN 150
LAT 63-290N	DAY 25	NO.DPTH 4	WND-DIR CALM	WW-CODE 02	
LON 78-360W	HR 21.3	W-COLOR 50	WND-FCE 00	CLD-TPE	
MARSD SQ 224		W-TRNSP 21	BARO 1016.8	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
213	0000	0140	32434	777	2598	14521
213	0010	-0032	32733	791	2631	14448
213	0020	-0054	32806	765	2638	14441
213	0030	-0056	32809	761	2639	14442

C-REF-NO 337	YR 1961	DEPTH 280	WAVES 1 00X0	AIR T 07.2	VIS 99
CONS. NO 151	MONTH 8	MXSAMPD 02	WAVES 2 X0	WET B	STN 151
LAT 63-360N	DAY 25	NO.DPTH 10	WND-DIR CALM	WW-CODE 02	
LON 78-560W	HR 23.1	W-COLOR 25	WND-FCE 00	CLD-TPE	
MARSD SQ 224		W-TRNSP 13	BARO 1016.1	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
231	0000	0226	31970	816	2555	14553
231	0010	0163	32105	822	2570	14528
231	0020	0116	32224	840	2583	14510
231	0030	0041	32471	780	2607	14482
231	0050	-0057	32676	762	2628	14443
231	0075	-0082	32815	750	2640	14437
231	0100	-0102	32932	745	2650	14433
231	0150	-0116	33069	733	2662	14437
231	0200	-0146	33269	732	2679	14434
231	0250	-0168	33523	727	2700	14435

C-REF-NO 337	YR 1961	DEPTH 212	WAVES 1 XX	AIR T 02.8	VIS 99
CONS. NO 152	MONTH 8	MXSAMPD 02	WAVES 2 XX	WET B	STN 152
LAT 63-420N	DAY 26	NO.DPTH 9	WND-DIR 250	WW-CODE 03	
LON 79-400W	HR 03.6	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1016.8	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
036	0000		31395	805		
036	0010	0203	31451	785	2515	14537
036	0020	0204	31466	802	2517	14539
036	0030	0162	31580	810	2529	14524
036	0050	-0001	32172	802	2585	14461
036	0075	-0148	32974	730	2655	14408
036	0100	-0163	33026	730	2659	14406
036	0150	-0163	33215	725	2675	14417
036	0180	-0168	33313	730	2683	14421

C-REF-NO 337 YR 1961 DEPTH 154 WAVES 1 XX AIR T 02.8 VIS 99  
 CONS. NO 153 MONTH 8 MXSAMPD 01 WAVES 2 XX WET B STN 153  
 LAT 63-450N DAY 26 NO.DPTH 8 WND-DIR 200 WW-CODE 03  
 LON 80-000W HR 05.1 W-COLOR WND-FCE 03 CLD-TPE  
 MARSD SQ 225 W-TRNSP BARO 1016.8 CLD-AMT 3 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
051	0000	0128	31311	812	2509	14500
051	0010	0096	31475	812	2524	14489
051	0020	0088	31531	816	2529	14488
051	0030	0072	31593	806	2535	14484
051	0050	0067	31602	802	2536	14485
051	0074	0030	31757	812	2550	14474
051	0099	-0024	32120	802	2582	14458
051	0139	-0109	32800	812	2640	14435

C-REF-NO 337 YR 1961 DEPTH 230 WAVES 1 XX AIR T 06.6 VIS 98  
 CONS. NO 154 MONTH 8 MXSAMPD 02 WAVES 2 XX WET B STN 154  
 LAT 63-020N DAY 26 NO.DPTH 10 WND-DIR 200 WW-CODE 02  
 LON 81-410W HR 13.0 W-COLOR 50 WND-FCE 03 CLD-TPE  
 MARSD SQ 225 W-TRNSP 22 BARO 1016.8 CLD-AMT 3 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
130	0000	0503	31491	715	2492	14665
130	0010	0502	31479	734	2491	14666
130	0020	0443	31548	724	2503	14644
130	0030	0421	31634	730	2512	14637
130	0050	0308	31960	768	2548	14596
130	0075	0083	32197	740	2583	14504
130	0100	-0142	32713	709	2633	14412
130	0150	-0107	32946	689	2651	14440
130	0200	-0101	33066	677	2661	14452
130	0210	-0101	33067	638	2661	14454



C-REF-NO 337	YR 1961	DEPTH 135	WAVES 1	XX	AIR T 07.2	VIS 98
CONS. NO 155	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 155
LAT 62-480N	DAY 26	NO.DPTH 8	WND-DIR 220	WW-CODE 01		
LON 81-200W	HR 15.8	W-COLOR 50	WND-FCE 03	CLD-TPE		
MARSD SQ 225		W-TRNSP 17	BARO 1015.1	CLD-AMT 3	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
158	0000	0475	31715	767	2512	14656
158	0010	0419	31708	751	2518	14634
158	0020	0407	31730	756	2521	14631
158	0030	0382	31750	751	2525	14622
158	0050	0224	31880	767	2548	14559
158	0075	-0159	32682	709	2631	14399
158	0100	-0120	32883	700	2647	14424
158	0110	-0118	32890	700	2647	14427

C-REF-NO 337	YR 1961	DEPTH 210	WAVES 1	XX	AIR T 10.0	VIS 98
CONS. NO 156	MONTH 8	MXSAMPD 02	WAVES 2	XX	WET B	STN 156
LAT 62-385N	DAY 26	NO.DPTH 9	WND-DIR 220	WW-CODE 02		
LON 80-470W	HR 18.4	W-COLOR 40	WND-FCE 03	CLD-TPE		
MARSD SQ 225		W-TRNSP 15	BARO 1014.4	CLD-AMT 3	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
184	0000	0420	31331	715	2488	14628
184	0010	0514	31367	718	2481	14669
184	0020	0450	31446	745	2494	14645
184	0030	0191	31694	800	2536	14538
184	0050	-0137	32391	751	2607	14401
184	0074	-0148	32699	705	2633	14404
184	0099	-0126	32826	700	2642	14420
184	0149	-0118	33085	678	2663	14436
184	0188	-0118	33092	617	2663	14443



C-REF-NO 337	YR 1961	DEPTH 55	WAVES 1 X1	AIR T 08.3	VIS 98
CONS. NO 157	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B	STN 157
LAT 62-210N	DAY 26	NO.DPTH 5	WND-DIR 200	WW-CODE 02	
LON 80-100W	HR 21.8	W-COLOR 50	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP 19	BARO 1013.4	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
218	0000	0610	30179	713	2376	14691
218	0010	0478	30253	732	2397	14639
218	0020	0379	30493	733	2425	14602
218	0030	0177	30910	719	2474	14521
218	0040	0013	31449	719	2526	14458

C-REF-NO 337	YR 1961	DEPTH 225	WAVES 1 X0	AIR T 07.2	VIS 98
CONS. NO 158	MONTH 8	MXSAMPD 02	WAVES 2 X0	WET B	STN 158
LAT 61-480N	DAY 27	NO.DPTH 9	WND-DIR 220	WW-CODE	
LON 81-580W	HR 04.5	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1012.7	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
045	0000	0730	29495	722	2308	14730
045	0010	0640	29482	699	2318	14696
045	0020	0630	29498	722	2320	14694
045	0030	0137		825		
045	0050	-0121	32260	604	2596	14407
045	0075	-0124	32735	593	2635	14416
045	0099	-0123	32920	599	2650	14423
045	0149	-0130	33086	566	2663	14431
045	0199	-0144	33187	487	2672	14434

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 208	WAVES 1 22X3	AIR T 08.9	VIS 98
CONS. NO 159	MONTH 8	MXSAMPD 02	WAVES 2 X0	WET B	STN 159
LAT 61-470N	DAY 27	NO.DPTH 9	WND-DIR 220	WW-CODE 00	
LON 84-520W	HR 14.0	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1010.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
140	0000	0480	31216	717	2472	14651
140	0010	0472	31219	744	2474	14650
140	0020	0449	31214	744	2476	14642
140	0030	-0024	31840	867	2559	14443
140	0050	-0135	32387	672	2607	14402
140	0075	-0127	32746	616	2636	14415
140	0100	-0118	32889	643	2647	14425
140	0150	-0124	33046	590	2660	14433
140	0200	-0134	33118	566	2666	14438

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 X1	AIR T 06.7	VIS 93
CONS. NO 160	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B	STN 160
LAT 62-340N	DAY 27	NO.DPTH 5	WND-DIR 220	WW-CODE 02	
LON 83-580W	HR 22.0	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1006.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
220	0000	0520	31210	727	2468	14668
220	0010	0516	31202	748	2468	14668
220	0020	0436	31345	756	2487	14638
220	0030	0333	31415	756	2502	14597
220	0035	0262	31606	756	2523	14569

C-REF-NO 337	YR 1961	DEPTH 132	WAVES 1 X1	AIR T 06.1	VIS 93
CONS. NO 161	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B	STN 161
LAT 62-49CN	DAY 28	NO.DPTH 8	WND-DIR 150	WW-CODE 02	
LCN 84-170W	HR 00.3	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1006.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
003	0000	0483	31464	734	2492	14656
003	0010	0455	31485	738	2496	14646
003	0020	0427	31564	732	2505	14637
003	0030	0217	31889	784	2549	14553
003	0050	-0130	32491	687	2615	14406
003	0075	-0124	32786	648	2639	14417
003	0100	-0120	32806	632	2640	14423
003	0115	-0122	32808	627	2641	14425

C-REF-NO 337	YR 1961	DEPTH 135	WAVES 1 X0	AIR T 04.4	VIS 93
CONS. NO 162	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B	STN 162
LAT 63-170N	DAY 28	NO.DPTH 8	WND-DIR 200	WW-CODE 02	
LCN 83-080W	HR 05.1	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1006.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
051	0000	0310	32075	767	2557	14591
051	0010	0292	32103	854	2561	14585
051	0020	0203	32213	854	2576	14549
051	0030	0062	32382	854	2599	14490
051	0050	-0147	32761	728	2638	14402
051	0075	-0146	32766	709	2638	14406
051	0100	-0146	32766	715	2638	14410
051	0120	-0148	32768	709	2638	14413

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1	X1	AIR T 02.8	VIS 94
CONS. NO 163	MONTH 8	MXSAMPD 00	WAVES 2	42	WET B	STN 163
LAT 63-560N	DAY 28	NO.DPTH 4	WND-DIR	090	WW-CODE 02	
LON 83-210W	HR 10.4	W-COLOR	WND-FCE	05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1008.6		CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
104	0000	0265	32155	804	2567	14572
104	0010	0197	32169	789	2573	14544
104	0020	0136	32291	784	2587	14520
104	0030	0008	32481	744	2609	14467

C-REF-NO 337	YR 1961	DEPTH 115	WAVES 1	X2	AIR T 05.6	VIS 93
CONS. NO 164	MONTH 8	MXSAMPD 01	WAVES 2	26	WET B	STN 164
LAT 62-550N	DAY 29	NO.DPTH 7	WND-DIR	180	WW-CODE	
LON 84-420W	HR 09.4	W-COLOR	WND-FCE	03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 989.7		CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
094	0000	0220	31990	801	2557	14550
094	0010	0216	32004	811	2559	14550
094	0020	0102	32236	816	2585	14504
094	0030	0033	32365	819	2599	14476
094	0050	-0111	32669	680	2629	14417
094	0075	-0122	32722	654	2634	14417
094	0100	-0122	32727	649	2634	14421



C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 X1	AIR T 04.4	VIS 93
CONS. NO 165	MONTH 8	MXSAMPD 00	WAVES 2 82	WET B	STN 165
LAT 63-030N	DAY 29	NO.DPTH 4	WND-DIR 190	WW-CODE 45	
LON 84-580W	HR 11.8	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 987.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	0025	32477	754	2608	14469
118	0010	0017	32489	752	2610	14468
118	0020	0016	32489	748	2610	14469
118	0025	0016	32496	748	2610	14470

C-REF-NO 337	YR 1961	DEPTH 88	WAVES 1 XO	AIR T 06.1	VIS 93
CONS. NO 166	MONTH 8	MXSAMPD 01	WAVES 2 XO	WET B	STN 166
LAT 63-020N	DAY 29	NO.DPTH 6	WND-DIR 240	WW-CODE	
LON 87-490W	HR 19.4	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 984.6	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
194	0000	0450	31946	749	2533	14649
194	0010	0425	31910	756	2533	14639
194	0020	0044	32442	763	2604	14481
194	0030	0001	32509	746	2612	14464
194	0050	-0073	32566	723	2620	14434
194	0065	-0084	32573	736	2620	14431

\*TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 113	WAVES 1 36X3	AIR T 03.9	VIS 95
CONS. NO 167	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B	STN 167
LAT 63-375N	DAY 30	NO.DPTH 8	WND-DIR 360	WW-CODE	
LON 87-520W	HR 01.0	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 984.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
010	0000	0440	32081	744	2545	14646
010	0010	0428	32076	754	2546	14643
010	0020	0378	32135	763	2555	14624
010	0030	0034	32352	812	2598	14477
010	0050	-0101	32673	807	2629	14422
010	0075	-0121	32831	784	2642	14419
010	0100	-0118	32848	682	2644	14425
010	0105	-0118	32857	693	2644	14426

C-REF-NO 337	YR 1961	DEPTH 146	WAVES 1 35X3	AIR T 03.3	VIS 93
CONS. NO 168	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B	STN 168
LAT 63-430N	DAY 30	NO.DPTH 8	WND-DIR 350	WW-CODE	
LON 88-160W	HR 02.9	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 986.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
029	0000	0425	32147	743	2552	14641
029	0010	0408	32281	814	2564	14637
029	0020	0244	32445	779	2592	14570
029	0030	0044	32592	795	2617	14485
029	0050	-0133	32930	736	2651	14411
029	0075	-0113	33121	747	2666	14427
029	0100	-0113	33138	743	2667	14431
029	0120	-0116	33145	742	2668	14433

C-REF-NO 337	YR 1961	DEPTH 58	WAVES 1 36X4	AIR T 02.8	VIS 93
CONS. NO 169	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B	STN 169
LAT 63-490N	DAY 30	NO.DPTH 5	WND-DIR 360	WW-CODE	
LON 88-340W	HR 04.6	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 989.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
046	0000	0325	32447	748	2585	14602
046	0010	0337	32456	752	2585	14609
046	0019	0304	32491	763	2590	14597
046	0029	0301	32500	815	2591	14597
046	0044	0298	32501	815	2592	14599

C-REF-NO 337	YR 1961	DEPTH 128	WAVES 1 30X9	AIR T 03.3	VIS 98
CONS. NO 170	MONTH 8	MXSAMPD 01	WAVES 2 X0	WET B	STN 170
LAT 62-580N	DAY 30	NO.DPTH 7	WND-DIR 340	WW-CODE 70	
LON 90-100W	HR 12.6	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1097.	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
126	0000	0320	30901	786	2463	14579
126	0010	0321	30891	806	2462	14581
126	0020	0320	30901	789	2463	14582
126	0030	0019	32172	757	2584	14467
126	0050	-0106	32619	717	2625	14419
126	0074	-0154	32995	712	2657	14405
126	0099	-0161	33076	685	2663	14407

C-REF-NO 337	YR 1961	DEPTH 55	WAVES 1 34X6	AIR T 03.3	VIS 99
CONS. NO 171	MONTH 8	MXSAMPD 00	WAVES 2 X0	WET B	STN 171
LAT 62-580N	DAY 30	NO.DPTH 5	WND-DIR 340	WW-CODE	
LON 90-280W	HR 14.1	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 999.8	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
141	0000	0181	31649	765	2533	14528
141	0010	0175	31659	763	2534	14527
141	0020	0162	31743	746	2542	14524
141	0030	0165	31723	754	2540	14527
141	0050	0115	31959	733	2562	14511

C-REF-NO 337	YR 1961	DEPTH 58	WAVES 1 X3	AIR T 02.8	VIS 98
CONS. NO 172	MONTH 8	MXSAMPD 00	WAVES 2 26	WET B	STN 172
LAT 62-290N	DAY 30	NO.DPTH 5	WND-DIR 340	WW-CODE 02	
LON 91-200W	HR 18.6	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1004.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
186	0000	0270	31398	760	2506	14564
186	0010	0265	31179	755	2489	14561
186	0020	0259	31194	755	2491	14560
186	0030	0143	31611	770	2532	14516
186	0050	0044	31985	765	2568	14479



C-REF-NO 337	YR 1961	DEPTH 101	WAVES 1 X3	AIR T 03.3	VIS 98
CONS. NO 173	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B	STN 173
LAT 62-300N	DAY 30	NO.DPTH 7	WND-DIR 340	WW-CODE 02	
LON 90-340W	HR 21.4	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1004.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
214	0000		31111	730		
214	0010	0515	31099	730	2460	14666
214	0020	0512	31099	781	2460	14666
214	0030	0024	32107	775	2579	14469
214	0050	-0133	32768	649	2638	14408
214	0075	-0147	32849	622	2645	14407
214	0085	-0148	32871	622	2646	14408

C-REF-NO 337	YR 1961	DEPTH 172	WAVES 1 32X3	AIR T 03.1	VIS 98
CONS. NO 174	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B	STN 174
LAT 62-310N	DAY 31	NO.DPTH 8	WND-DIR 320	WW-CODE	
LON 89-280W	HR 01.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1004.9	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
012	0000	0449	31090	747	2466	14637
012	0010	0447	31041		2462	14637
012	0020	0446	31094		2466	14639
012	0030	0146	31869	825	2553	14521
012	0050	-0129	32689	801	2631	14409
012	0075		32990	699		
012	0100	-0172	33223	719	2676	14405
012	0150	-0180	33429	699	2692	14412

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 32X3	AIR T 03.3	VIS 98
CONS. NO 175	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B	STN 175
LAT 62-300N	DAY 31	NO.DPTH 7	WND-DIR 320	WW-CODE 50	
LON 88-100W	HR 06.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1006.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
062	0000	0460	31320	723	2483	14644
062	0010	0553	31289	775	2470	14684
062	0020	0550	31336	771	2474	14685
062	0030	0390	31897	771	2535	14628
062	0050	-0103	32186	688	2590	14414
062	0075	-0148	32586	638	2623	14403
062	0100	-0143	32868	660	2646	14413

C-REF-NO 337	YR 1961	DEPTH 134	WAVES 1 X2	AIR T 01.7	VIS 98
CONS. NO 176	MONTH 8	MXSAMPD 01	WAVES 2 26	WET B	STN 176
LAT 62-305N	DAY 31	NO.DPTH 8	WND-DIR 340	WW-CODE 02	
LON 86-520W	HR 10.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1008.3	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
108	0000	0410	32033	770	2544	14633
108	0010	0401	32066	754	2548	14631
108	0020	0399	32026	766	2545	14631
108	0030	0218	32159	812	2571	14557
108	0050	-0145	32543	719	2620	14399
108	0075	-0150	32757	663	2637	14404
108	0100	-0149	32770	650	2638	14409
108	0110	-0148	32776	650	2639	14411

C-REF-NO 337	YR 1961	DEPTH 201	WAVES 1 29X2	AIR T 02.8	VIS 98
CONS. NO 177	MONTH 8	MXSAMPD 02	WAVES 2 26	WET B	STN 177
LAT 61-445N	DAY 31	NO.DPTH 9	WND-DIR 290	WW-CODE 50	
LON 87-280W	HR 18.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1010.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
182	0000	0604	30762	705	2423	14696
182	0010	0611	30872	714	2431	14702
182	0020	0618	31015	718	2441	14709
182	0030	0478	31296	772	2479	14657
182	0050	-0118	32217	801	2593	14408
182	0075	-0124	32698	674	2632	14416
182	0100	-0119	32856	659	2644	14424
182	0150	-0134	33068	647	2662	14429
182	0175	-0143	33171	512	2671	14430

C-REF-NO 337	YR 1961	DEPTH 128	WAVES 1 18X4	AIR T 04.4	VIS 97
CONS. NO 178	MONTH 9	MXSAMPD 01	WAVES 2 26	WET B	STN 178
LAT 61-450N	DAY 01	NO.DPTH 7	WND-DIR 180	WW-CODE	
LON 90-020W	HR 02.9	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 1001.2	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
029	0000	0619	30679	724	2415	14701
029	0010	0613	30749	728	2421	14702
029	0020	0610	30834	719	2428	14703
029	0030	0058	31672	922	2542	14478
029	0050	-0103	31925	852	2569	14411
3 029	0075	-0145	32985	590	2656	14410
3 029	0100	-0143	32713	638	2634	14411

C-REF-NO 337	YR 1961	DEPTH 73	WAVES 1 17X4	AIR T 04.4	VIS 95
CONS. NO 179	MONTH 9	MXSAMPD 01	WAVES 2 26	WET B	STN 179
LAT 61-280N	DAY 01	NO.DPTH 6	WND-DIR 120	WW-CODE	
LON 92-400W	HR 14.0	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 993.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
140	0000	0275	31750	764	2534	14571
140	0010	0259	31763	772	2536	14566
140	0020	0224	31859	766	2546	14554
140	0030	0187	32008	745	2561	14541
140	0050	0181	32082	752	2567	14542
140	0065	0150	32164	750	2576	14532

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 X3	AIR T 05.6	VIS 93
CONS. NO 180	MONTH 9	MXSAMPD 00	WAVES 2 46	WET B	STN 180
LAT 61-000N	DAY 01	NO.DPTH 4	WND-DIR 070	WW-CODE	
LON 93-390W	HR 20.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 986.0	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
208	0000	0450	25743	766	2043	14566
208	0010	0495	31648	750	2505	14665
208	0020	0467	31748	750	2516	14656
208	0025	0466	31733	758	2515	14657



C-REF-NO 337	YR 1961	DEPTH 99	WAVES 1 09X3	AIR T 06.1	VIS 93
CONS. NO 181	MONTH 9	MXSAMPD 01	WAVES 2 1246	WET B	STN 181
LAT 61-000N	DAY 01	NO.DPTH 7	WND-DIR 060	WW-CODE 02	
LON 93-050W	HR 23.5	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 987.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
235	0000	0575	30991	740	2444	14688
235	0010	0547	31123	750	2458	14680
235	0020	0494	31525	762	2495	14665
235	0030	0186	32185	792	2575	14543
235	0050	0029	32435	812	2605	14479
235	0075	-0042	32520	772	2615	14451
235	0080	-0056	32532	751	2616	14446

C-REF-NO 337	YR 1961	DEPTH 110	WAVES 1 09X3	AIR T 05.6	VIS 97
CONS. NO 182	MONTH 9	MXSAMPD 01	WAVES 2 0946	WET B	STN 182
LAT 61-000N	DAY 02	NO.DPTH 7	WND-DIR 090	WW-CODE 02	
LON 92-130W	HR 03.7	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 984.9	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
037	0000	0720	29986	720	2348	14733
037	0010	0708	29971	715	2348	14729
037	0020	0650	30841	751	2424	14719
037	0030	0295	32121	841	2562	14590
037	0050	-0120	32496	749	2615	14411
037	0075	-0156	32698	649	2633	14401
037	0090	-0156	32723	633	2635	14403

C-REF-NO 337	YR 1961	DEPTH 134	WAVES 1 X2	AIR T 07.8	VIS 97
CONS. NO 183	MONTH 9	MXSAMPD 01	WAVES 2 26	WET B	STN 183
LAT 61-000N	DAY 02	NO.DPTH 8	WND-DIR 120	WW-CODE 02	
LON 90-090W	HR 11.6	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 226		W-TRNSP	BARO 983.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
116	0000	0660	29580	714	2323	14704
116	0010	0657	29577	754	2323	14704
116	0020	0631	29897	750	2352	14699
116	0030	-0046	31661	938	2546	14430
116	0050	-0130	32179	812	2590	14401
116	0075	-0157	32651	678	2629	14399
116	0100	-0157	32897	631	2649	14407
116	0115	-0154	33012		2658	14413

C-REF-NO 337	YR 1961	DEPTH 177	WAVES 1 14X1	AIR T 07.2	VIS 97
CONS. NO 184	MONTH 9	MXSAMPD 02	WAVES 2 42	WET B	STN 184
LAT 61-000N	DAY 02	NO.DPTH 9	WND-DIR 140	WW-CODE	
LON 88-050W	HR 19.0	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 984.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
190	0000	0570	29968	728	2364	14672
190	0010	0582	30050	729	2369	14680
190	0020	0524	30280	771	2394	14661
190	0030	-0117	31255	886	2515	14391
190	0050	-0140	32359	786	2605	14399
190	0075	-0126	32694	778	2632	14415
190	0100	-0126	32851	663	2644	14421
190	0149	-0136	33051	667	2661	14427
190	0173	-0142	33127	657	2667	14429

C-REF-NO 337	YR 1961	DEPTH 230	WAVES 1 27X3	AIR T 06.7	VIS 93
CONS. NO 185	MONTH 9	MXSAMPD 02	WAVES 2 42	WET B	STN 185
LAT 61-000N	DAY 03	NO.DPTH 9	WND-DIR 270	WW-CODE 02	
LON 86-000W	HR 02.1	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 990.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
021	0000	0625	29848	703	2348	14693
021	0010	0630	29887	726	2351	14697
021	0020	0331	30221	819	2408	14578
021	0030	-0118	31043	883	2498	14388
021	0050	-0138	32229	663	2594	14398
021	0074	-0128	32899	635	2648	14416
021	0099	-0125	33019	635	2658	14424
021	0149	-0148	33172	565	2671	14423
021	0198	-0152	33296	463	2681	14431

C-REF-NO 337	YR 1961	DEPTH 190	WAVES 1 27X2	AIR T 06.1	VIS 93
CONS. NO 186	MONTH 9	MXSAMPD 02	WAVES 2 82	WET B	STN 186
LAT 61-000N	DAY 03	NO.DPTH 9	WND-DIR 270	WW-CODE	
LON 83-550W	HR 09.2	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 994.1	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
092	0000	0650	29609	727	2327	14700
092	0010	0646	29602	727	2327	14700
092	0020	0646	29604	738	2327	14702
092	0029	0497	29885	762	2366	14646
092	0049	-0139	31550	831	2539	14388
092	0073	-0137	32752	633	2637	14410
092	0098	-0135	32986	633	2655	14418
092	0147	-0149	33246	513	2677	14423
092	0166	-0150	33220	477	2675	14426



C-REF-NO 337	YR 1961	DEPTH 159	WAVES 1 22X2	AIR T 06.7	VIS 95
CONS. NO 187	MONTH 9	MXSAMPD 01	WAVES 2 2282	WET B	STN 187
LAT 61-010N	DAY 03	NO.DPTH 8	WND-DIR 170	WW-CODE	
LON 81-510W	HR 15.0	W-COLOR	WND-FCE 02	CLD-TPE 6	
MARSD SQ 225		W-TRNSP	BARO 992.4	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
150	0000	0643	29542	703	2322	14696
150	0010	0637	29519	722	2321	14695
150	0020	0621	29654	715	2334	14692
150	0030	-0080	30726	865	2471	14401
150	0050	-0126	31966	668	2573	14400
150	0075	-0121	32666	599	2629	14417
150	0100	-0122	32969	593	2654	14425
150	0135	-0136		532		

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 30X3	AIR T 05.0	VIS 98
CONS. NO 188	MONTH 9	MXSAMPD 00	WAVES 2 3082	WET B	STN 188
LAT 59-000N	DAY 10	NO.DPTH 4	WND-DIR 320	WW-CODE	
LON 93-460W	HR 15.2	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1006.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
152	0000	0582	31118		2453	14692
152	0010	0582	31099		2452	14694
152	0020	0580	31091		2452	14694
152	0025	0582	31092		2451	14696



C-REF-NO 337	YR 1961	DEPTH 27	WAVES 1 32X3	AIR T 06.1	VIS 97
CONS. NO 189	MONTH 9	MXSAMPD 00	WAVES 2 3026	WET B	STN 189
LAT 59-000N	DAY 10	NO.DPTH 3	WND-DIR 330	WW-CODE 03	
LON 94-140W	HR 18.4	W-COLOR	WND-FCE 06	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1007.6	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
184	0000	0675	30505		2394	14722
184	0010	0670	30488		2393	14721
184	0020	0666	30533		2397	14722

C-REF-NO 337	YR 1961	DEPTH 27	WAVES 1 33X3	AIR T 06.7	VIS 97
CONS. NO 190	MONTH 9	MXSAMPD 00	WAVES 2 3026	WET B	STN 190
LAT 59-000N	DAY 10	NO.DPTH 3	WND-DIR 330	WW-CODE	
LON 93-300W	HR 21.4	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1008.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
214	0000	0565	31148		2458	14686
214	0010	0562	31182		2461	14686
214	0020	0562	31170		2460	14688

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 33X4	AIR T 06.7	VIS 97
CONS. NO 191	MONTH 9	MXSAMPD 00	WAVES 2 3326	WET B	STN 191
LAT 59-000N	DAY 10	NO.DPTH 4	WND-DIR 330	WW-CODE 01	
LON 93-050W	HR 23.4	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1007.3	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
234	0000	0480	28703		2274	14618
234	0010	0520	28833		2280	14638
234	0020	0354	30557		2432	14592
234	0030	0347	30650		2440	14592

C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 30X4	AIR T 03.9	VIS 97
CONS. NO 192	MONTH 9	MXSAMPD 01	WAVES 2 3226	WET B	STN 192
LAT 59-000N	DAY 11	NO.DPTH 6	WND-DIR 320	WW-CODE	
LON 92-400W	HR 01.9	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1008.0	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
019	0000	0541	28034		2215	14635
019	0010	0538	28006		2213	14635
019	0020	0168	30965		2479	14517
019	0030	-0006	31523		2533	14447
019	0050	-0139	32052		2580	14395
019	0060	-0148	32099		2584	14393

C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1 29X6	AIR T 04.4	VIS 98
CONS. NO 193	MONTH 9	MXSAMPD 01	WAVES 2 2926	WET B	STN 193
LAT 58-110N	DAY 11	NO.DPTH 6	WND-DIR 290	WW-CODE	
LON 90-070W	HR 15.3	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1005.9	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
153	0000		26073			
153	0010	0503	26065		2064	14595
153	0020	0360	27275		2172	14551
153	0030	-0132	30957		2491	14380
153	0050	-0161	31914		2569	14383
153	0100	-0158				

C-REF-NO 337	YR 1961	DEPTH 75	WAVES 1 29X4	AIR T 02.8	VIS 96
CONS. NO 194	MONTH 9	MXSAMPD 01	WAVES 2 2926	WET B	STN 194
LAT 57-440N	DAY 12	NO.DPTH 7	WND-DIR 290	WW-CODE	
LON 88-360W	HR 00.6	W-COLOR	WND-FCE 07	CLD-TPE 5	
MARSD SQ 189		W-TRNSP	BARO 1009.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	006 0000	0300	25400	712	2027	14497
3	006 0010	0296	29257	723	2334	14548
3	006 0020	0006	25311	779	2033	14365
	006 0030	-0092	30524	779	2455	14393
	006 0050	-0153	31926	640	2570	14387
	006 0060	-0157	32516	549	2618	14395
	006 0070	-0157	32562	558	2622	14397

C-REF-NO 337	YR 1961	DEPTH 84	WAVES 1 32X2	AIR T 04.4	VIS 98
CONS. NO 195	MONTH 9	MXSAMPD 01	WAVES 2 X0	WET B	STN 195
LAT 56-490N	DAY 13	NO.DPTH 6	WND-DIR 320	WW-CODE	
LON 79-122W	HR 14.7	W-COLOR	WND-FCE 02	CLD-TPE 6	
MARSD SQ 188		W-TRNSP	BARO 1019.5	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
147	0000	0373	27504	730	2189	14557
147	0010	0370	27508	697	2189	14557
147	0020	0354	27678	695	2204	14554
147	0030	0226	28307	692	2263	14508
147	0050	0046	29262	683	2349	14443
147	0075	0000	29643	667	2381	14431

C-REF-NO 337	YR 1961	DEPTH 64	WAVES 1 XX	AIR T 02.8	VIS 96
CONS. NO 196	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 196
LAT 56-100N	DAY 14	NO.DPTH 5	WND-DIR	WW-CODE	
LON 78-580W	HR 02.2	W-COLOR	WND-SPD	CLD-TPE 3	
MARSD SQ 188		W-TRNSP	BARO 1017.4	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
022	0000	0580	27967	732	2206	14650
022	0010	0583	27944	742	2203	14652
022	0020	0552	27981	737	2210	14642
022	0030	0266	28441	752	2271	14527
022	0045	-0028	29341	720	2358	14409



C-REF-NO 337	YR 1961	DEPTH 51	WAVES 1	XO	AIR T 01.1	VIS 98
CONS. NO 197	MONTH 9	MXSAMPD 00	WAVES 2	XO	WET B	STN 197
LAT 55-595N	DAY 14	NO.DPTH 5	WND-DIR 300		WW-CODE	
LON 79-060W	HR 04.0	W-COLOR	WND-FCE 01		CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1016.8		CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
040	0000		28008	742		
040	0010	0548	28002	758	2212	14639
040	0020	0532	28036	742	2216	14634
040	0030	0424	28174	767	2237	14592
040	0040	0128	28822	753	2310	14473

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1	XX	AIR T 02.5	VIS 98
CONS. NO 198	MONTH 9	MXSAMPD 00	WAVES 2	XX	WET B	STN 198
LAT 55-500N	DAY 14	NO.DPTH 1	WND-DIR 210		WW-CODE	
LON 79-120W	HR 11.0	W-COLOR	WND-FCE 04		CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1013.7		CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
110	0000					

Gravimeter and bathythermograph observations  
and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 XX	AIR T 03.9	VIS 98
CONS. NO 199	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 199
LAT 55-435N	DAY 14	NO.DPTH 1	WND-DIR 180	WW-CODE 02	
LON 79-170W	HR 12.5	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1012.7	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
125	0000					

Gravimeter and bathythermograph observations  
and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 172	WAVES 1 XX	AIR T 04.4	VIS 98
CONS. NO 200	MONTH 9	MXSAMPD 02	WAVES 2 XX	WET B	STN 200
LAT 55-480N	DAY 14	NO.DPTH 9	WND-DIR 210	WW-CODE	
LON 79-094W	HR 14.1	W-COLOR	WND-FCE 04	CLD-TPE 3	
MARSD SQ 188		W-TRNSP	BARO 1010.7	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
141	0000		28092	753		
141	0010	0492	28074	744	2223	14616
141	0020	0491	28077	751	2223	14618
141	0030	0358	28295	754	2253	14566
141	0050	-0036	29372	734	2361	14406
141	0075	-0110	29707	714	2390	14380
141	0100	-0120	29790	711	2397	14381
141	0150	-0122	29886	711	2404	14390
141	0160	-0122	29893	711	2405	14391

C-REF-NO 337	YR 1961	DEPTH 176	WAVES 1 XX	AIR T 03.9	VIS 98
CONS. NO 201	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 201
LAT 55-480N	DAY 14	NO.DPTH 1	WND-DIR 220	WW-CODE	
LON 79-150W	HR 23.0	W-COLOR	WND-FCE 01	CLD-TPE 5	
MARSD SQ 188		W-TRNSP	BARO 999.8	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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230 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 154	WAVES 1 XX	AIR T 03.9	VIS 98
CONS. NO 202	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 202
LAT 55-480N	DAY 15	NO.DPTH 1	WND-DIR 220	WW-CODE	
LON 79-130W	HR 00.2	W-COLOR	WND-FCE 01	CLD-TPE 4	
MARSD SQ 188		W-TRNSP	BARO 999.8	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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002 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 146	WAVES 1 XX	AIR T 03.9	VIS 98
CONS. NO 203	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 203
LAT 55-480N	DAY 15	NO.DPTH 1	WND-DIR 220	WW-CODE	
LON 79-120W	HR 01.2	W-COLOR	WND-FCE 03	CLD-TPE 4	
MARSD SQ 188		W-TRNSP	BARO 999.2	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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012 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 22	WAVES 1 XX	AIR T 03.3	VIS 95
CONS. NO 204	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 204
LAT 56-161N	DAY 15	NO.DPTH 1	WND-DIR 290	WW-CODE	
LON 78-568W	HR 10.0	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 992.1	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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100 0000

Gravimeter observation.



C-REF-NO 337	YR 1961	DEPTH 44	WAVES 1 32X4	AIR T 04.4	VIS 96
CONS. NO 205	MONTH 9	MXSAMPD 00	WAVES 2 3282	WET B	STN 205
LAT 56-280N	DAY 16	NO.DPTH 1	WND-DIR 320	WW-CODE	
LON 78-540W	HR 12.8	W-COLOR	WND-FCE 05	CLD-TPE 4	
MARSD SQ 188		W-TRNSP	BARO 999.8	CLD-AMT 5	HW

## O B S E R V E D

GMT DEPTH T E M P S A L OXYGEN SGMT SOUND

128 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 32X4	AIR T 04.4	VIS 97
CONS. NO 206	MONTH 9	MXSAMPD 00	WAVES 2 3282	WET B	STN 206
LAT 56-410N	DAY 16	NO.DPTH 1	WND-DIR 320	WW-CODE	
LON 79-000W	HR 14.8	W-COLOR	WND-FCE 05	CLD-TPE 4	
MARSD SQ 188		W-TRNSP	BARO 1004.6	CLD-AMT 5	HW

## O B S E R V E D

GMT DEPTH T E M P S A L OXYGEN SGMT SOUND

148 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 64	WAVES 1 32X4	AIR T 04.4	VIS 97
CONS. NO 207	MONTH 9	MXSAMPD 00	WAVES 2 3282	WET B	STN 207
LAT 56-515N	DAY 16	NO.DPTH 1	WND-DIR 320	WW-CODE	
LON 79-180W	HR 16.8	W-COLOR	WND-FCE 04	CLD-TPE 4	
MARSD SQ 188		W-TRNSP	BARO 1006.6	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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168 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 88	WAVES 1 XX	AIR T 05.0	VIS 97
CONS. NO 208	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 208
LAT 57-000N	DAY 16	NO.DPTH 1	WND-DIR 320	WW-CODE 02	
LON 79-380W	HR 18.7	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1008.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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187 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 55	WAVES 1 XX	AIR T 04.4	VIS 97
CONS. NO 209	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 209
LAT 57-020N	DAY 16	NO.DPTH 1	WND-DIR 280	WW-CODE	
LON 80-000W	HR 20.3	W-COLOR	WND-FGE 02	CLD-TPE 4	
MARSD SQ 189		W-TRNSP	BARO 1009.3	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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203	0000					
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Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 110	WAVES 1 27X4	AIR T 03.9	VIS 98
CONS. NO 210	MONTH 9	MXSAMPD 01	WAVES 2 3282	WET B	STN 210
LAT 56-540N	DAY 16	NO.DPTH 6	WND-DIR 270	WW-CODE 02	
LON 80-260W	HR 23.9	W-COLOR	WND-FGE 03	CLD-TPE 4	
MARSD SQ 189		W-TRNSP	BARO 1010.7	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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239	0000	0400	27818	765	2211	14572
239	0010	0397	27797	759	2210	14572
239	0020	0384	27788	732	2210	14568
239	0030	-0002	29820	856	2396	14425
239	0050	-0131	31033	743	2497	14385
239	0080	-0146	31637	748	2546	14391

C-REF-NO 337	YR 1961	DEPTH 141	WAVES 1 17X3	AIR T 05.6	VIS 97
CONS. NO 211	MONTH 9	MXSAMPD 00	WAVES 2 1782	WET B	STN 211
LAT 56-540N	DAY 17	NO.DPTH 1	WND-DIR 170	WW-CODE	
LON 81-200W	HR 05.0	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1005.3	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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050 0000

Gravimeter observation and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 110	WAVES 1 XX	AIR T 05.0	VIS 97
CONS. NO 212	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 212
LAT 56-540N	DAY 17	NO.DPTH 1	WND-DIR 240	WW-CODE	
LON 82-120W	HR 08.4	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 999.4	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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084 0000

Gravimeter observation.



C-REF-NO 337	YR 1961	DEPTH 150	WAVES 1 22X4	AIR T 06.7	VIS 98
CONS. NO 213	MONTH 9	MXSAMPD 01	WAVES 2 1782	WET B	STN 213
LAT 56-540N	DAY 17	NO.DPTH 8	WNC-DIR 220	WW-CODE 02	
LCN 83-060W	HR 11.9	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 996.1	CLD-AMT 3	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	CXYGEN	SGMT	SOUND
	119	0000	0400	27689	755	2201	14571
	119	0010	0420	27688	767	2199	14581
	119	0020	0048	30247	904	2428	14452
	119	0030	-0110	31211	873	2511	14394
	119	0050	-0157	31657	798	2548	14381
	119	0075	-0153	32474	619	2614	14399
4	119	0100		32942	517		
4	119	0150	-0148	32993	552	2656	14421

C-REF-NO 337	YR 1961	DEPTH 172	WAVES 1 22X4	AIR T 07.8	VIS 98
CONS. NO 214	MONTH 9	MXSAMPD 00	WAVES 2 1482	WET B	STN 214
LAT 56-540N	DAY 17	NO.DPTH 1	WNC-DIR 220	WW-CODE	
LCN 83-460W	HR 15.2	W-COLOR	WND-FCE 04	CLD-TPE 4	
MARSD SQ 189		W-TRNSP	BARO 996.5	CLD-AMT 6	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	CXYGEN	SGMT	SOUND
	152	0000					

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 159	WAVES 1 22X3	AIR T 07.8	VIS 98
CONS. NO 215	MONTH 9	MXSAMPD 01	WAVES 2 1782	WET B	STN 215
LAT 56-540N	DAY 17	NO.DPTH 8	WND-DIR 220	WW-CODE 02	
LON 84-280W	HR 17.5	W-COLOR	WND-FCE 04	CLD-TPE 4	
MARSD SQ 189		W-TRNSP	BARO 993.1	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
175	0000	0380	26594	788	2116	14547
175	0010	0361	26650	788	2122	14542
175	0020	-0050	30419	935	2446	14409
175	0030	-0132	31127	881	2505	14382
175	0050	-0154	31670	839	2549	14383
175	0075	-0155	32371	643	2606	14396
175	0100	-0147	32962	552	2654	14413
175	0135	-0148	33129	484	2667	14420

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 XX	AIR T 08.3	VIS 97
CONS. NO 216	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 216
LAT 56-540N	DAY 17	NO.DPTH 1	WND-DIR 220	WW-CODE	
LON 85-250W	HR 21.6	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 992.4	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
216	0000					

Gravimeter and bathythermograph observations  
and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 66	WAVES 1 XX	AIR T 07.8	VIS 98
CONS. NO 217	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 217
LAT 56-540N	DAY 18	NO.DPTH 5	WND-DIR 220	WW-CODE 03	
LON 86-180W	HR 01.4	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 991.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
014	0000	0380	27932	767	2222	14565
014	0010	0370	27933	767	2223	14563
014	0020	0156	28814	793	2308	14482
014	0030	0134	31284	825	2507	14507
014	0050	-0144	31429	791	2530	14384

C-REF-NO 337	YR 1961	DEPTH 58	WAVES 1 22X2	AIR T 08.9	VIS 98
CONS. NO 218	MONTH 9	MXSAMPD 00	WAVES 2 XO	WET B	STN 218
LAT 56-540N	DAY 18	NO.DPTH 1	WND-DIR 220	WW-CODE 02	
LON 87-200W	HR 05.6	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 991.0	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
056	0000					

Gravimeter observation and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 13	WAVES 1 XX	AIR T 05.0	VIS 97
CENS. NO 219	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 219
LAT 56-540N	DAY 18	NO.DPTH 3	WND-DIR 260	WW-CODE	
LON 88-320W	HR 10.2	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 995.4	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
102	0000	0535	26457	749	2091	14612
102	0005	0529	26444	749	2091	14610
102	0010	0527	26445	742	2091	14610

C-REF-NO 337	YR 1961	DEPTH 26	WAVES 1 27X3	AIR T 08.3	VIS 98
CENS. NO 220	MONTH 9	MXSAMPD 00	WAVES 2 X0	WET B	STN 220
LAT 57-100N	DAY 18	NO.DPTH 1	WND-DIR 270	WW-CODE 02	
LON 88-590W	HR 12.8	W-COLOR	WND-FCE 05	CLD-TPE 6	
MARSD SQ 189		W-TRNSP	BARO 997.1	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
128	0000		26558			

Gravimeter and bathythermograph observations  
and sea floor sample.



C-REF-NO 337	YR 1961	DEPTH 68	WAVES 1 30X6	AIR T 08.3	VIS 98
CONS. NO 221	MONTH 9	MXSAMPD 00	WAVES 2 3026	WET B	STN 221
LAT 57-300N	DAY 18	NO.DPTH 1	WND-DIR 300	WW-CODE 03	
LON 89-340W	HR 17.8	W-COLOR	WND-FCE 07	CLD-TPE 6	
MARSD SQ 189		W-TRNSP	BARO 1003.2	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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178	0000		26970			
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Bathythermograph observation and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 80	WAVES 1 33X6	AIR T 01.7	VIS 98
CONS. NO 222	MONTH 9	MXSAMPD 01	WAVES 2 3326	WET B	STN 222
LAT 58-000N	DAY 19	NO.DPTH 6	WND-DIR 330	WW-CODE	
LON 91-000W	HR 03.6	W-COLOR	WND-FCE 04	CLD-TPE 5	
MARSD SQ 190		W-TRNSP	BARO 1018.1	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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036	0000	0355	27363	789	2179	14547
036	0010	0359	27345	765	2177	14550
036	0020	0365	27362	777	2178	14554
036	0030	-0120	31662	768	2548	14396
036	0050	-0144	31793	761	2559	14389
036	0065	-0152	31868	761	2565	14389

C-REF-NO 337	YR 1961	DEPTH 66	WAVES 1 XX	AIR T 00.6	VIS 97
CONS. NO 223	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 223
LAT 58-170N	DAY 19	NO.DPTH 5	WND-DIR 330	WW-CODE	
LON 91-340W	HR 07.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1019.5	CLD-AMT 8	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	078	0000	0355	27856	772	2218	14553
	078	0010	0359	27817	828	2215	14556
3	078	0020	-0150	31804	772	2560	14382
3	078	0030	-0150	31651	767	2548	14381
	078	0040	-0150	31871	750	2566	14386

C-REF-NO 337	YR 1961	DEPTH 77	WAVES 1 33X3	AIR T 00.4	VIS 98
CONS. NO 224	MONTH 9	MXSAMPD 01	WAVES 2 3526	WET B	STN 224
LAT 58-350N	DAY 19	NO.DPTH 5	WND-DIR 330	WW-CODE 02	
LON 92-080W	HR 11.7	W-COLOR	WND-FCE 02	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1018.1	CLD-AMT 6	HW

## O B S E R V E D

	GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
	117	0000	0320	28752	789	2292	14550
	117	0010	0335	29041	767	2314	14562
	117	0020	0388	29242	756	2325	14589
	117	0029	0296	31726	750	2530	14585
3	117	0059	-0042	31067	744	2498	14429

C-REF-NO 337	YR 1961	DEPTH 82	WAVES 1 32X3	AIR T 00.6	VIS 98
CONS. NO 225	MONTH 9	MXSAMPD 01	WAVES 2 3526	WET B	STN 225
LAT 58-530N	DAY 19	NO.DPTH 6	WND-DIR 320	WW-CODE 02	
LON 92-410W	HR 15.1	W-COLOR	WND-FCE 04	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1015.1	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
151	0000	0369	30413	763	2420	14594
151	0010	0369	30393	763	2418	14595
151	0020	0394	30620	753	2434	14610
151	0030	0416		730		
151	0050	0262	31334	754	2502	14568
151	0060	0245	31373	756	2506	14563

C-REF-NO 337	YR 1961	DEPTH 46	WAVES 1 24X3	AIR T 01.4	VIS 99
CONS. NO 226	MONTH 9	MXSAMPD 00	WAVES 2 3526	WET B	STN 226
LAT 58-530N	DAY 19	NO.DPTH 4	WND-DIR 240	WW-CODE 02	
LON 92-550W	HR 16.4	W-COLOR	WND-FCE 04	CLD-TPE 6	
MARSD SQ 190		W-TRNSP	BARO 1013.4	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
164	0000	0405	30478	739	2422	14610
164	0010	0420	30476	752	2420	14618
164	0020	0446	30784	750	2442	14635
164	0030	0446	31296	728	2482	14643

C-REF-NO 337	YR 1961	DEPTH 22	WAVES 1 22X3	AIR T 01.7	VIS 99
CONS. NO 227	MONTH 9	MXSAMPD 00	WAVES 2 3526	WET B	STN 227
LAT 58-530N	DAY 19	NO.DPTH 3	WND-DIR 220	WW-CODE 02	
LON 93-040W	HR 17.9	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1013.4	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
179	0000	0534	30652	720	2422	14666
179	0010		30876	719		
179	0015		31111	728		

C-REF-NO 337	YR 1961	DEPTH 60	WAVES 1 XX	AIR T 03.9	VIS 97
CONS. NO 228	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 228
LAT 59-030N	DAY 19	NO.DPTH 1	WND-DIR 180	WW-CODE	
LON 94-020W	HR 22.9	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1009.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
229	0000					

Bathythermograph observation and sea floor sample.



C-REF-NO 337	YR 1961	DEPTH 68	WAVES 1 XX	AIR T 03.9	VIS 97
CONS. NO 229	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 229
LAT 59-100N	DAY 19	NO.DPTH 1	WND-DIR 180	WW-CODE	
LON 93-580W	HR 23.9	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1008.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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239 0000

Bathythermograph observation and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 60	WAVES 1 19X2	AIR T 03.9	VIS 99
CONS. NO 230	MONTH 9	MXSAMPD 00	WAVES 2 X0	WET B	STN 230
LAT 59-180N	DAY 20	NO.DPTH 1	WND-DIR 190	WW-CODE	
LON 93-580W	HR 01.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1007.3	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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012 0000

Bathythermograph observation and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH	51	WAVES 1 19X2	AIR T 03.9	VIS 99
CONS. NO 231	MONTH 9	MXSAMPD	00	WAVES 2 X0	WET B	STN 231
LAT 59-03CN	DAY 20	NO.DPTH	1	WND-DIR 190	WW-CODE	
LON 94-01SW	HR 03.6	W-COLOR		WND-FCE 06	CLD-TPE	
MARSD SQ 190		W-TRNSP		BARO 1005.9	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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036 0000

Sea floor sample.

C-REF-NO 337	YR 1961	DEPTH		WAVES 1 XX	AIR T 03.3	VIS 99
CONS. NO 232	MONTH 9	MXSAMPD	00	WAVES 2 XX	WET B	STN 232
LAT 59-575N	DAY 20	NO.DPTH	1	WND-DIR 170	WW-CODE	
LON 94-045W	HR 04.4	W-COLOR		WND-FCE 06	CLD-TPE	
MARSD SQ 190		W-TRNSP		BARO 1005.9	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
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044 0000

Bathymograph lowering and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 27	WAVES 1 XX	AIR T 03.3	VIS 99
CONS. NO 233	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 233
LAT 58-520N	DAY 20	NO.DPTH 1	WND-DIR 170	WW-CODE 02	
LON 94-180W	HR 05.2	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1005.3	CLD-AMT 3	HW

## O B S E R V E D

GMT DEPTH T E M P S A L OXYGEN SGMT SOUND

052 0000

#TIME-DISTANCE CHECK FAILED

Bathymograph lowering and sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 24	WAVES 1 XX	AIR T 05.0	VIS 97
CONS. NO 234	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 234
LAT 59-000N	DAY 21	NO.DPTH 1	WND-DIR 340	WW-CODE	
LON 94-180W	HR 20.0	W-COLOR	WND-FCE 02	CLD-TPE 4	
MARSD SQ 190		W-TRNSP	BARO 999.2	CLD-AMT 7	HW

## O B S E R V E D

GMT DEPTH T E M P S A L OXYGEN SGMT SOUND

200 0000

Gravimeter observation.

C-REF-NO 337	YR 1961	DEPTH 51	WAVES 1 XX	AIR T	VIS 97
CONS. NO 235	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 235
LAT 59-040N	DAY 21	NO.DPTH 1	WND-DIR 340	WW-CODE	
LON 94-030W	HR 21.3	W-COLOR	WND-FCE 02	CLD-TPE 4	
MARSD SQ 190		W-TRNSP	BARO 999.2	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
213	0000					

Sea floor sample.

C-REF-NO 337	YR 1961	DEPTH 31	WAVES 1 XX	AIR T 02.2	VIS 96
CONS. NO 236	MONTH 9	MXSAMPD 00	WAVES 2 XX	WET B	STN 236
LAT 59-000N	DAY 27	NO.DPTH 4	WND-DIR 040	WW-CODE	
LON 94-150W	HR 18.1	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1012.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
181	0000	0402	30234		2402	14605
181	0010	0400	30281		2406	14607
181	0020	0448	31301		2483	14642
181	0025	0448				



C-REF-NO 337	YR 1961	DEPTH 33	WAVES 1 09X4	AIR T 02.2	VIS 95
CONS. NO 237	MONTH 9	MXSAMPD 00	WAVES 2 0926	WET B	STN 237
LAT 59-000N	DAY 28	NO.DPTH 4	WND-DIR 090	WW-CODE 69	
LON 93-540W	HR 00.6	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1011.4	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
006	0000	0430	31354		2489	14632
006	0010	0440	31358		2488	14638
006	0020	0438	31412		2492	14640
006	0030	0435	31439		2495	14640

C-REF-NO 337	YR 1961	DEPTH 37	WAVES 1 09X4	AIR T 03.3	VIS 95
CONS. NO 238	MONTH 9	MXSAMPD 00	WAVES 2 0926	WET B	STN 238
LAT 59-000N	DAY 28	NO.DPTH 4	WND-DIR 090	WW-CODE	
LON 93-330W	HR 02.6	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 190		W-TRNSP	BARO 1010.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
026	0000	0420	31460		2498	14629
026	0010	0420	31482		2500	14631
026	0020	0419	31488		2500	14633
026	0030	0418	31495		2501	14634

C-REF-NO 337	YR 1961	DEPTH	29	WAVES 1 09X4	AIR T 03.3	VIS 95
CONS. NO 239	MONTH 9	MXSAMPD	00	WAVES 2 0926	WET B	STN 239
LAT 59-000N	DAY 28	NO.DPTH	4	WND-DIR 100	WW-CODE	
LON 93-150W	HR 04.5	W-COLOR		WND-FCE 05	CLD-TPE	
MARSD SQ 190		W-TRNSP		BARO 1008.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
045	0000	0420	31259		2482	14627
045	0004	0413	31062		2467	14622
045	0014	0408	31160		2475	14623
045	0024	0407	31225		2481	14625

C-REF-NO 337	YR 1961	DEPTH	88	WAVES 1 XX	AIR T 02.8	VIS 93
CONS. NO 240	MONTH 9	MXSAMPD	01	WAVES 2 XX	WET B	STN 240
LAT 59-000N	DAY 28	NO.DPTH	6	WND-DIR 080	WW-CODE	
LON 92-400W	HR 08.1	W-COLOR		WND-FCE 04	CLD-TPE	
MARSD SQ 190		W-TRNSP		BARO 1009.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
081	0000	0300	30665		2445	14567
081	0010	0296	30657		2445	14567
081	0020	0298	30796		2456	14571
081	0030	0292	30968		2470	14573
081	0050	-0106	32172		2589	14413
081	0074	-0112	32213		2592	14414

C-REF-NO 337	YR 1961	DEPTH 90	WAVES 1 XX	AIR T 00.6	VIS 97
CONS. NO 241	MONTH 10	MXSAMPD 01	WAVES 2 XX	WET B	STN 241
LAT 55-550N	DAY 01	NO.DPTH 7	WND-DIR 270	WW-CODE	
LON 84-470W	HR 10.4	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1001.2	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
104	0000	0360	27829	739	2215	14555
104	0010	0355	27229	744	2168	14547
104	0020	0355	27222	767	2168	14548
104	0030	0232	27229	800	2177	14496
104	0040	0034	30137	789	2420	14448
104	0050	-0080	30938	789	2488	14408
104	0080	-0154	31991	716	2575	14392

C-REF-NO 337	YR 1961	DEPTH 29	WAVES 1 30X6	AIR T 02.8	VIS 96
CONS. NO 242	MONTH 10	MXSAMPD 00	WAVES 2 3026	WET B	STN 242
LAT 55-380N	DAY 01	NO.DPTH 4	WND-DIR 300	WW-CODE 01	
LON 84-570W	HR 13.0	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1005.9	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
130	0000	0420	27387	828	2175	14575
130	0010	0429	27415	749	2177	14581
130	0020	0429	27402	740	2176	14583
130	0025	0432	27402	738	2176	14585

C-REF-NO 337	YR 1961	DEPTH 31	WAVES 1 XX	AIR T 03.3	VIS 97
CONS. NO 243	MONTH 10	MXSAMPD 00	WAVES 2 XX	WET B	STN 243
LAT 55-340N	DAY 01	NO.DPTH 4	WND-DIR 300	WW-CODE	
LON 83-320W	HR 18.8	W-COLOR	WND-FCE 07	CLD-TPE 2	
MARSD SQ 189		W-TRNSP	BARO 1007.3	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
188	0000	0420	27394	739	2176	14575
188	0010	0428	27381	739	2174	14580
188	0020	0428	27378	745	2174	14582
188	0025	0430	27380	743	2174	14583

C-REF-NO 337	YR 1961	DEPTH 73	WAVES 1 30X6	AIR T 02.8	VIS 97
CONS. NO 244	MONTH 10	MXSAMPD 01	WAVES 2 3046	WET B	STN 244
LAT 55-340N	DAY 01	NO.DPTH 6	WND-DIR 300	WW-CODE	
LON 82-000W	HR 23.8	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1010.2	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
238	0000	0400	27350	765	2174	14566
238	0010	0402	27339	769	2173	14568
238	0020	0403	27337	762	2173	14571
238	0030	0372	27441	767	2184	14560
238	0050	0004	30377	792	2440	14439
238	0060	-0055	30814	795	2478	14419

\*TIME-DISTANCE CHECK FAILED



C-REF-NO 337 YR 1961 DEPTH 49 WAVES 1 30X4 AIR T 03.3 VIS 97  
 CONS. NO 245 MONTH 10 MXSAMPD 00 WAVES 2 3026 WET B STN 245  
 LAT 55-080N DAY 02 NO.DPTH 4 WND-DIR 300 WW-CODE  
 LON 81-300W HR 03.1 W-COLOR WND-FCE 07 CLD-TPE  
 MARSD SQ 189 W-TRNSP BARO 1016.1 CLD-AMT 7 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
031	0000	0400	27206	762	2163	14564
031	0010	0406	27206	762	2162	14568
031	0020	0405	27266	773	2167	14570
031	0030	0396	27278	782	2169	14568

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337 YR 1961 DEPTH 20 WAVES 1 27X3 AIR T -03.9 VIS 99  
 CONS. NO 246 MONTH 10 MXSAMPD 00 WAVES 2 2782 WET B STN 246  
 LAT 54-470N DAY 02 NO.DPTH 3 WND-DIR 270 WW-CODE 01  
 LON 82-000W HR 05.4 W-COLOR WND-FCE 06 CLD-TPE  
 MARSD SQ 189 W-TRNSP BARO 1016.8 CLD-AMT 3 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
054	0000	0490	25545	722	2024	14581
054	0008	0531	25467	728	2014	14598
054	0018	0535	25485	733	2015	14602

#TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 40	WAVES 1 XX	AIR T -03.9	VIS 99
CONS. NO 247	MONTH 10	MXSAMPD 00	WAVES 2 XX	WET B	STN 247
LAT 54-470N	DAY 02	NO.DPTH 4	WND-DIR 270	WW-CODE	
LON 81-320W	HR 07.8	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1017.8	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
078	0000	0390	27164		2160	14559
078	0010	0395	27144		2158	14563
078	0020	0392	27150		2159	14563
078	0030	0394	27154		2159	14566

C-REF-NO 337	YR 1961	DEPTH 73	WAVES 1 XX	AIR T -03.9	VIS 99
CONS. NO 248	MONTH 10	MXSAMPD 01	WAVES 2 XX	WET B	STN 248
LAT 54-470N	DAY 02	NO.DPTH 6	WND-DIR 270	WW-CODE	
LON 80-570W	HR 10.1	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1019.1	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
101	0000	0420	27078	739	2151	14571
101	0010	0421	27080	756	2151	14573
101	0020	0420	27172	756	2158	14576
101	0030	0386	27418	762	2181	14566
101	0050	-0056	30798	767	2476	14417
101	0070	-0106	31091	745	2501	14401

C-REF-NO 337	YR 1961	DEPTH 106	WAVES 1 29X3	AIR T 02.8	VIS 98
CONS. NO 249	MONTH 10	MXSAMPD 01	WAVES 2 2926	WET B	STN 249
LAT 54-470N	DAY 02	NO.DPTH 7	WND-DIR 290	WW-CODE 02	
LON 80-250W	HR 12.8	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1018.8	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
128	0000	0420	26882	753	2136	14569
128	0010	0438	26873	742	2133	14578
128	0020	0442	26880	741	2133	14581
128	0030	0346	27693	784	2206	14552
128	0050	-0117	30621	694	2464	14386
128	0075	-0140	31593	683	2543	14393
128	0100	-0147	31757	671	2556	14396

C-REF-NO 337	YR 1961	DEPTH 119	WAVES 1 29X3	AIR T 02.8	VIS 98
CONS. NO 250	MONTH 10	MXSAMPD 01	WAVES 2 2926	WET B	STN 250
LAT 54-570N	DAY 02	NO.DPTH 7	WND-DIR 290	WW-CODE	
LON 80-000W	HR 15.0	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1018.8	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
150	0000	0530	24171	722	1912	14580
150	0010	0530	24149	762	1910	14581
150	0020	0502	24395	745	1932	14574
150	0030	0328	27101	719	2160	14537
150	0050	0009	29813	737	2395	14433
150	0075	-0130	31015	710	2496	14389
150	0100	-0146	31522	644	2537	14393

C-REF-NO 337	YR 1961	DEPTH	99	WAVES 1 27X3	AIR T 02.8	VIS 98
CONS. NO 251	MONTH 10	MXSAMPD	01	WAVES 2 2726	WET B	STN 251
LAT 55-010N	DAY 02	NO.DPTH	6	WND-DIR 270	WW-CODE	
LON 80-000W	HR 16.9	W-COLOR		WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP		BARO 1018.8	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
169	0000	0490	25509	745	2021	14580
169	0010	0485	25500	818	2021	14580
169	0020	0457	26203	649	2079	14579
169	0030	0290	28282	751	2257	14536
169	0050	-0062	30271	739	2434	14407
169	0075	-0116	30931	717	2489	14395

C-REF-NO 337	YR 1961	DEPTH	77	WAVES 1 XX	AIR T	VIS 98
CONS. NO 252	MONTH 10	MXSAMPD	01	WAVES 2 XX	WET B	STN 252
LAT 55-230N	DAY 02	NO.DPTH	6	WND-DIR 300	WW-CODE	
LON 80-140W	HR 19.3	W-COLOR		WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP		BARO 1018.5	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
193	0000	0460	25658	767	2035	14569
193	0010	0472	25651	762	2034	14576
193	0020	0274	27622	737	2205	14518
193	0030	0063	29339	754	2354	14448
193	0049	-0016	29986	757	2410	14424
193	0069	-0104	30915	751	2487	14399

4TIME-DISTANCE CHECK FAILED



C-REF-NO 337	YR 1961	DEPTH 117	WAVES 1 27X3	AIR T 02.2	VIS 98
CONS. NO 253	MONTH 10	MXSAMPD 01	WAVES 2 2726	WET B	STN 253
LAT 56-000N	DAY 03	NO.DPTH 7	WND-DIR 270	WW-CODE	
LON 81-150W	HR 02.9	W-COLOR	WND-FCE 06	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1018.1	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
029	0000	0390	27513	745	2188	14564
029	0010	0388	27511	778	2188	14565
029	0020	0379	27575	757	2194	14563
029	0030	-0101	30156	840	2426	14383
029	0050	-0140	31264	739	2516	14384
029	0075	-0148	32465	582	2614	14401
029	0100	-0146	32831	588	2643	14411

C-REF-NO 337	YR 1961	DEPTH 146	WAVES 1 XX	AIR T 02.8	VIS 97
CONS. NO 254	MONTH 10	MXSAMPD 01	WAVES 2 XX	WET B	STN 254
LAT 57-020N	DAY 03	NO.DPTH 8	WND-DIR 300	WW-CODE 02	
LON 81-100W	HR 10.2	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1017.8	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
102	0000	0420	26793	748	2128	14567
102	0010	0416	26778	753	2128	14567
102	0020	0044	29721	753	2386	14443
102	0030	-0103	30665	745	2467	14390
102	0050	-0138	31530	672	2538	14389
102	0075	-0146	32038	678	2579	14396
102	0100	-0148	32287	593	2599	14403
102	0140	-0146	32870	504	2646	14418

C-REF-NO 337	YR 1961	DEPTH 117	WAVES 1 24X4	AIR T 04.2	VIS 99
CONS. NO 255	MONTH 10	MXSAMPD 01	WAVES 2 2426	WET B	STN 255
LAT 57-59N	DAY 03	NO.DPTH 7	WND-DIR 240	WW-CODE 02	
LON 81-100W	HR 17.2	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1016.8	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
172	0000	0340	28964	707	2307	14562
172	0010	0336	29027	757	2312	14563
172	0020	0329	28958	762	2308	14560
172	0030	-0103	30914	847	2487	14393
172	0050	-0147	31556	770	2540	14385
172	0075	-0148	32569	582	2622	14403
172	0100	-0147	32924	588	2651	14412

C-REF-NO 337	YR 1961	DEPTH 170	WAVES 1 XX	AIR T 02.8	VIS 97
CONS. NO 256	MONTH 10	MXSAMPD 02	WAVES 2 XX	WET B	STN 256
LAT 58-38N	DAY 03	NO.DPTH 8	WND-DIR 190	WW-CODE	
LON 81-030W	HR 22.0	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 189		W-TRNSP	BARO 1012.7	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
220	0000	0320	29207	774	2328	14556
220	0010	0311	29208	757	2329	14554
220	0020	0310	29210	767	2329	14555
220	0030	0130	30071	789	2410	14489
220	0050	-0142	31562	851	2540	14387
220	0075	-0156	31964	744	2573	14390
220	0100	-0144	32590	543	2624	14409
220	0165	-0146	33142	432	2668	14426

C-REF-NO 337	YR 1961	DEPTH 159	WAVES 1 20X6	AIR T 03.1	VIS 98
CONS. NO 257	MONTH 10	MXSAMPD 01	WAVES 2 2026	WET B	STN 257
LAT 58-390N	DAY 04	NO.DPTH 8	WND-DIR 200	WW-CODE	
LON 79-260W	HR 03.8	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 188		W-TRNSP	BARO 1013.4	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
038	0000	0410	27862	773	2214	14577
038	0010	0406	27893	769	2217	14578
038	0020	0396	27938	763	2221	14576
038	0030	0105	29928	742	2400	14476
038	0050	-0034	30478	735	2450	14423
038	0075	-0130	31462	738	2532	14395
038	0100	-0146	32027	683	2578	14400
038	0150	-0142	32503	571	2616	14417

C-REF-NO 337	YR 1961	DEPTH 132	WAVES 1 20X6	AIR T 04.4	VIS 94
CONS. NO 258	MONTH 10	MXSAMPD 01	WAVES 2 2026	WET B	STN 258
LAT 60-000N	DAY 04	NO.DPTH 6	WND-DIR 180	WW-CODE 63	
LON 79-040W	HR 12.3	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 999.8	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
123	0000	0370	28471	784	2266	14568
123	0010	0362	28477	751	2267	14566
123	0020	0362	28482	775	2267	14568
123	0030	0099	29588	771	2373	14468
123	0050	-0084	30740	771	2472	14403
123	0075	-0146	31468	766	2533	14388

TIME-DISTANCE CHECK FAILED

C-REF-NO 337	YR 1961	DEPTH 91	WAVES 1 X6	AIR T 05.0	VIS 97
CONS. NO 259	MONTH 10	MXSAMPD 01	WAVES 2 26	WET B	STN 259
LAT 60-430N	DAY 06	NO.DPTH 6	WND-DIR 330	WW-CODE 02	
LON 78-480W	HR 17.3	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 991.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
173	0000	0450	26044	784	2067	14570
173	0010	0422	27225	769	2162	14576
173	0020	0420	27353	764	2173	14578
173	0030	0408	27557	745	2190	14577
173	0050	0376	27972	769	2225	14572
173	0080	0238	29184	764	2332	14533

C-REF-NO 337	YR 1961	DEPTH 124	WAVES 1 XX	AIR T 05.6	VIS 98
CONS. NO 260	MONTH 10	MXSAMPD 01	WAVES 2 XX	WET B	STN 260
LAT 60-470N	DAY 06	NO.DPTH 8	WND-DIR 330	WW-CODE	
LON 79-050W	HR 18.9	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 994.1	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
189	0000	0370	27537	778	2192	14556
189	0010	0360	27984	756	2228	14559
189	0020	0349	28123	733	2240	14558
189	0030	0321	28646	739	2283	14554
189	0049	0130	29744	817	2384	14488
189	0074	-0113	31070	717	2500	14398
189	0099	-0140	31842	700	2563	14400
189	0118	-0142	31933	703	2570	14403



C-REF-NO 337	YR 1961	DEPTH 150	WAVES 1	XX	AIR T 05.6	VIS 98
CONS. NO 261	MONTH 10	MXSAMPD 01	WAVES 2	XX	WET B	STN 261
LAT 60-430N	DAY 06	NO.DPTH 8	WND-DIR 330	WW-CODE		
LON 79-240W	HR 20.8	W-COLOR	WND-FCE 03	CLD-TPE		
MARSD SQ 224		W-TRNSP	BARO 997.5	CLD-AMT 7	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
208	0000	0340	29083	756	2317	14563
208	0010	0339	29432	767	2344	14569
208	0020	0314	29693	754	2367	14564
208	0030	0309	29817	762	2377	14565
208	0050	-0120	31227	756	2513	14393
208	0075	-0139	31781	756	2558	14396
208	0100	-0119	32353	722	2604	14417
208	0140	-0136	32909	656	2649	14424

C-REF-NO 337	YR 1961	DEPTH 176	WAVES 1	XX	AIR T 01.1	VIS 96
CONS. NO 262	MONTH 10	MXSAMPD 02	WAVES 2	XX	WET B	STN 262
LAT 61-000N	DAY 07	NO.DPTH 8	WND-DIR 040	WW-CODE		
LON 82-000W	HR 05.6	W-COLOR	WND-FCE 05	CLD-TPE		
MARSD SQ 225		W-TRNSP	BARO 1007.6	CLD-AMT 8	HW	

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
056	0000	0270	30158	756	2407	14547
056	0010	0266	30449	756	2431	14551
056	0020	0254	30708	756	2452	14551
056	0030	0249	30715	762	2453	14551
056	0050	-0120	32170	745	2589	14406
056	0075	-0123	32756	644	2636	14417
056	0100	-0124		582		
056	0160	-0147	33200	515	2673	14426

C-REF-NO 337	YR 1961	DEPTH 230	WAVES 1 03X4	AIR T 00.0	VIS 97
CONS. NO 263	MONTH 10	MXSAMPD 02	WAVES 2 0326	WET B	STN 263
LAT 61-500N	DAY 07	NO.DPTH 9	WND-DIR 030	WW-CODE	
LON 81-560W	HR 12.4	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1010.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
124	0000	0230	30657	796	2450	14537
124	0010	0226	30613	781	2447	14536
124	0020	0222	30698	784	2454	14537
124	0030	0099	31097	762	2494	14489
124	0050	-0094	32449	656	2611	14422
124	0075	-0084	32890	712	2646	14437
124	0100	-0100	32946	672	2651	14435
124	0150	-0094	33099	691	2663	14448
124	0200		33163	638		

C-REF-NO 337	YR 1961	DEPTH 212	WAVES 1 XX	AIR T	VIS 96
CONS. NO 264	MONTH 10	MXSAMPD 02	WAVES 2 XX	WET B	STN 264
LAT 62-350N	DAY 07	NO.DPTH 9	WND-DIR 030	WW-CODE	
LON 80-500W	HR 21.2	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 225		W-TRNSP	BARO 1007.3	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
212	0000	0170	30756	775	2462	14511
212	0010	0163	30749	797	2462	14510
212	0020	0164	30756	754	2463	14512
212	0030	0101	31772	786	2548	14499
212	0050	-0039	32583	749	2620	14450
212	0075	-0063	32861	739	2643	14446
212	0100	-0061	32937	737	2649	14453
212	0150	-0060	33110	734	2663	14464
212	0200	-0071	33186	739	2670	14468

C-REF-NO 337	YR 1961	DEPTH 490	WAVES 1 XX	AIR T	VIS 93
CONS. NO 265	MONTH 10	MXSAMPD 04	WAVES 2 XX	WET B	STN 265
LAT 62-380N	DAY 08	NO.DPTH 13	WND-DIR 040	WW-CODE	
LON 78-000W	HR 06.8	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 224		W-TRNSP	BARO 1001.5	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
068	0000	0370	28713	745	2285	14571
068	0010	0387	28203	784	2243	14574
068	0020	0364	28437	750	2263	14568
068	0030	0274	29733	717	2373	14548
068	0049	0024	30584	717	2456	14451
068	0074	-0081	31279	712	2516	14416
068	0099	-0056	31492	712	2532	14435
068	0148	-0010	33077	745	2658	14486
068	0197	-0012	33104	762	2660	14494
068	0246	-0024	33161	739	2666	14497
068	0296	-0050	33194	717	2669	14494
068	0394	-0066	33315	712	2680	14504
068	0443	-0070	33427	689	2689	14512

C-REF-NO 337	YR 1961	DEPTH 274	WAVES 1 XX	AIR T -01.1	VIS 98
CONS. NO 266	MONTH 10	MXSAMPD 02	WAVES 2 XX	WET B	STN 266
LAT 59-370N	DAY 10	NO.DPTH 10	WND-DIR 300	WW-CODE	
LON 66-330W	HR 06.0	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 187		W-TRNSP	BARO 1018.8	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
060	0000	0120	32466	728	2602	14512
060	0010	0112	32445	852	2601	14510
060	0020	0114	32453	784	2601	14513
060	0030	0113	32456	773	2602	14514
060	0050	0108	32469	790	2603	14515
060	0075	0084	32567	745	2612	14510
060	0100	0075	32610	688	2616	14510
060	0150	0044	32847	728	2637	14508
060	0200	0000	32989	723	2651	14498
060	0250	-0001	33053	717	2656	14507



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CANADA

DATA RECORD  
**FRANKLIN AND DARNLEY BAYS, N. W. T.**

**No. 2**

**1964 Data Record Series**

**Canadian Oceanographic Data Centre**

Programmed by the  
**Canadian Committee on Oceanography**

**1964**

ROGER DUHAMEL, F. R. S. C.  
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OTTAWA, 1964

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CANADIAN OCEANOGRAPHIC DATA CENTRE

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Data Record

FRANKLIN and DARNLEY BAYS, N.W.T.

(C.O.D.C. Reference: 04-63-002)

No. 2

1964 Data Record Series

Programmed by the Canadian Committee on Oceanography

FISHERIES RESEARCH BOARD OF CANADA

Franklin and Darnley Bays, N.W.T.

Ship:	M.V. "Salvelinus"
Local Cruise designation:	Salvelinus 1963
Cruise period:	July 24 - August 28, 1963
Observers:	Mr. D. Patriquin
	Mr. I. Gidney
	Mr. G. Harding

ARCTIC UNIT - Montreal

## **SECTION I**

**Description of data collection procedures**



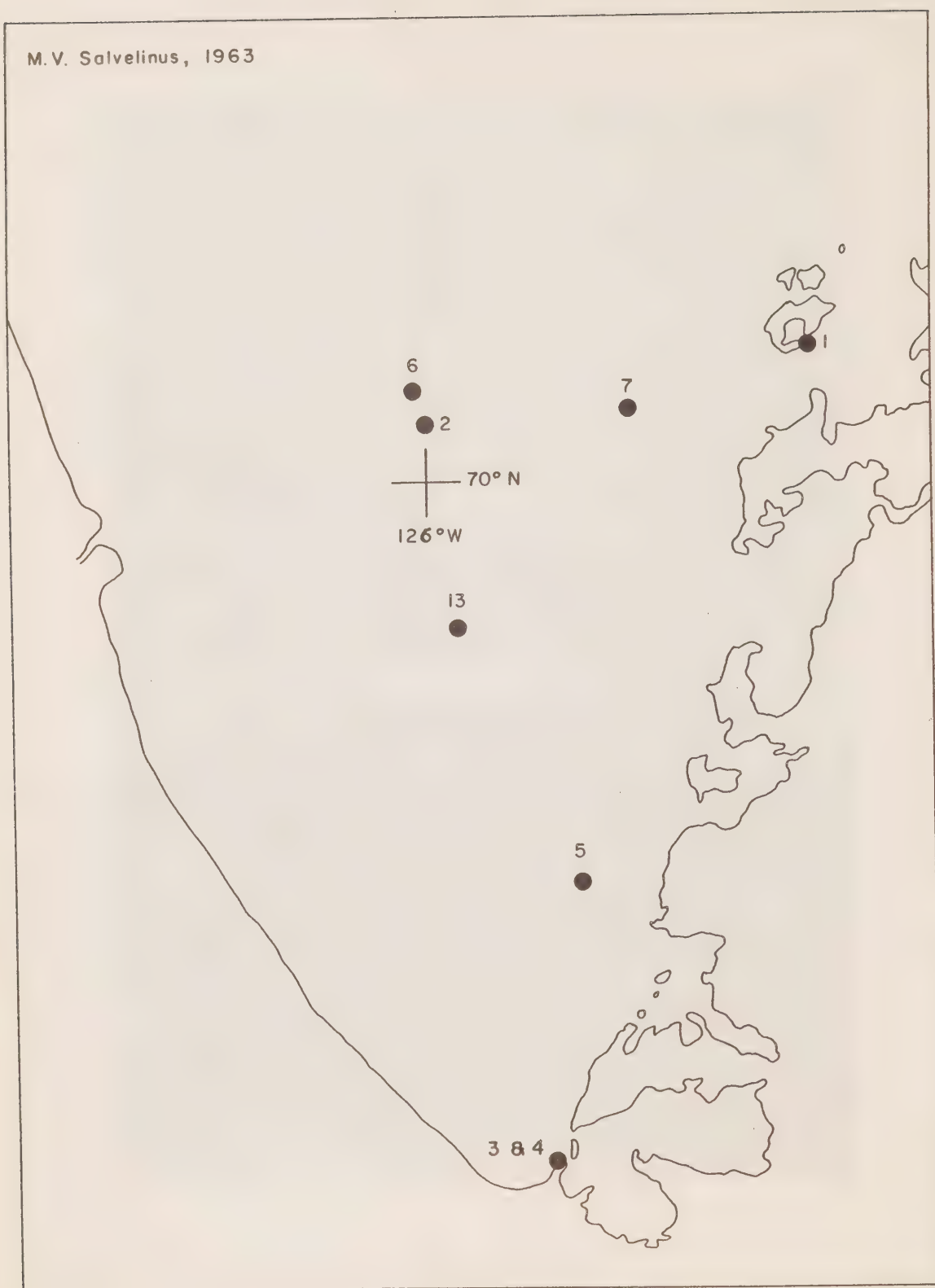


"SALVELINUS"



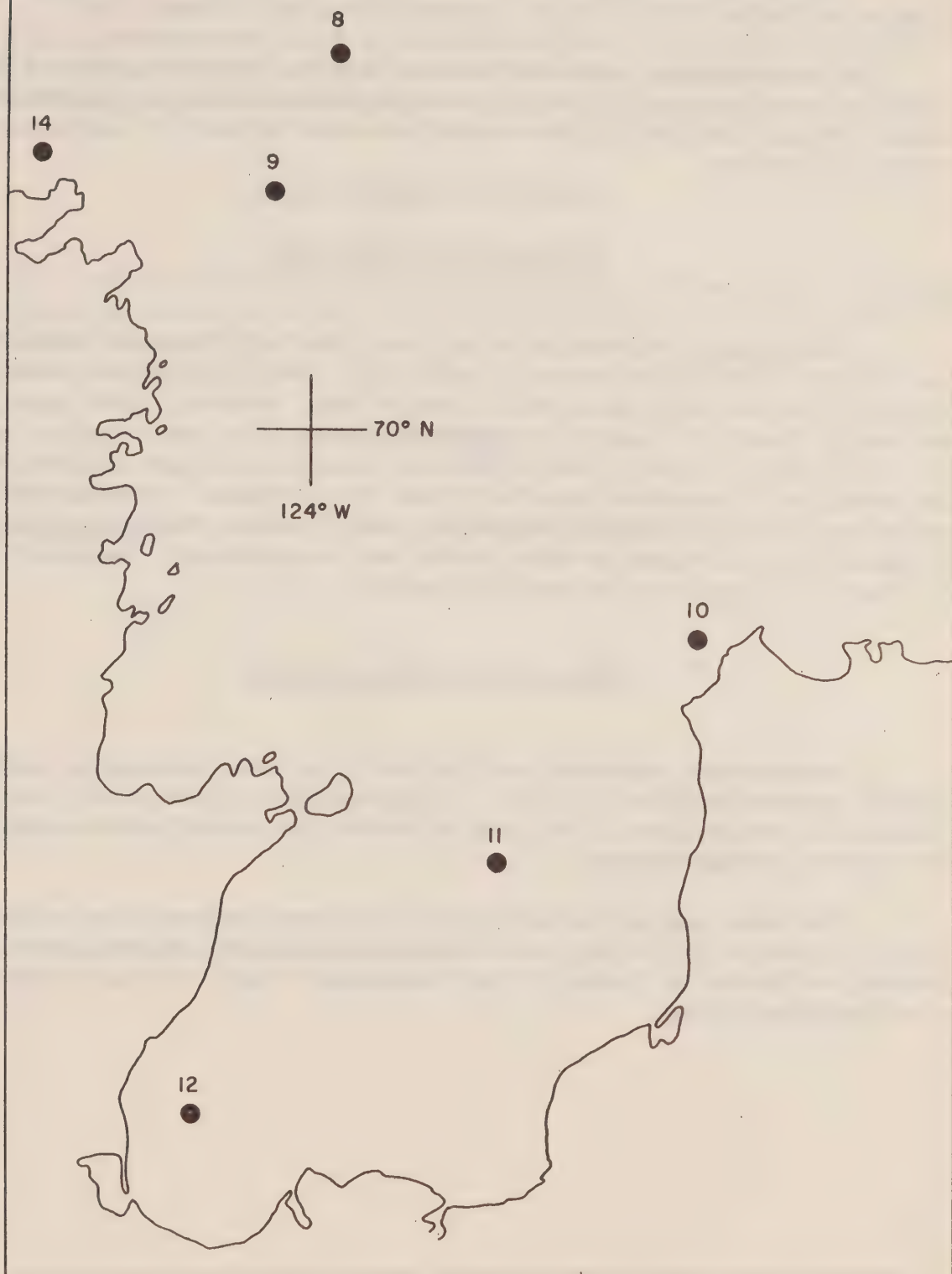
Fisheries Research Board

M.V. Salvelinus, 1963



Franklin Bay

M.V. Salvelinus, 1963



Darnley Bay

## INTRODUCTION

Fourteen oceanographic stations were occupied by the M.V. Salvelinus in Franklin and Darnley Bays, N.W.T., between 24 July and 28 August 1963.

The main purpose of the field investigations was the carrying out of a biological collecting programme consisting of fishing and the collecting of marine invertebrates. Physical and chemical observations were made primarily to supplement biological collecting.

## EXTRACT OF CRUISE LOG

The Salvelinus departed on 23 July from Cape Parry Harbour. Collecting was carried out in Franklin Bay between 24 and 26 July, after which time the vessel was confined in Langton Bay by gales from 27 until 31 July. Between 1 and 8 August work was done in Franklin Bay and in northwest Darnley Bay. The vessel was then held at Cape Parry until 11 August. Pearce Point was visited on 12 August, southern Darnley Bay from 13 to 15 August and Cape Parry from 16 to 18 August. Following this, collecting was continued in eastern Franklin Bay until 27 August. The Salvelinus returned to Cape Parry on 28 August, in which vicinity work was done until 7 September, when the vessel was hauled out of the sea for the winter.

## OBSERVATION PROCEDURES

Oceanographic collecting was done from a hydraulic hydrographic winch fitted with 225 metres of stainless steel wire. Laboratory space, which is small and used primarily for the treatment of biological collections, contains a titration apparatus for the analysis of oxygen samples.

Both subsurface and surface water samples were collected from casts with Nansen reversing water bottles, each fitted with two protected reversing thermometers (Negretti and Zambra or Yoshino). Observations were made at 18 stations with a 275-metre bathythermograph.



### LABORATORY PROCEDURES

Salinity samples were analysed at the Bedford Institute of Oceanography with a N. I. O. conductivity bridge, within 3 months of collecting. Oxygen samples were titrated on the Salvelinus using the Winkler method.

### BATHYTHERMOGRAPH DATA

B.T. slides were processed at the Bedford Institute of Oceanography, Dartmouth, N.S. Copies of the slides are on file at the Arctic Unit of the Fisheries Research Board of Canada, Montreal.

### PERSONNEL

At sea: D. Patriquin (in charge), I. Gidney and G. Harding.



## SECTION II

Description of the machine-generated data record





## INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation cycle.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. If interpolations are carried out, additional derived quantities are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct-image masters. These masters subsequently yield the required volume of copies for distribution.

Provision has been made to enter an "**estimate of precision**" for each observed variable selected for interpolation at the standard oceanographic depth. The precision depends on the instrument or technique used to determine the variable.

A standard precision stated as a **standard deviation** ( $\sigma$ ) can be determined for each instrument or technique under routine field conditions by making duplicate determinations of the variables for a homogeneous sample of sea water. These standard deviations are given for each cruise under "GENERAL INFORMATION" of section II of the data record.

The **measurement error estimate** of a specific observation in this data record, is stated as a multiple of the standard deviation derived as above, and entered in a column immediately to the right of the reported variable. In order to distinguish it from an additional decimal digit, the measurement error estimate is recorded alphabetically, (i.e.,  $1\sigma = A$ ,  $2\sigma = B$ , etc.; in this data record "A" is suppressed).

An option is provided with respect to the measurement of the salinity variable. If observed to three decimal digits, the last digit takes the place of the measurement error estimate.

In the past, a number of methods for both manual and machine interpolation have been developed. Studies and comparisons of the several methods have shown that no single method is universally acceptable. The manual methods are the most elaborate and flexible, but often require subjective decisions. In machine interpolation, all the present methods fail to yield acceptable results under some circumstances. Hence, it is considered necessary to qualify interpolated values by stating an "**interpolation error estimate**" derived from the particular interpolation formula used. There are two purposes in stating the error estimates; **first**, to give an indication of the quality of interpolated data; **second**, to allow the oceanographer to redesign his observational procedures in order to reduce interpolation errors in future observations.

The interpolation scheme chosen for the OCEANS II program consists of a combination of two 3-point interpolations using the Lagrangian interpolation polynomial, as recommended by Rattray (1962). A parabola is fitted through three values of a given variable ( $T$ ,  $S$ ,  $O_2$ ) considered as a function of depth. The two interpolation parabolas require a total of four points (observed depths). The middle points are common to both parabolas. The average of the two values obtained from the parabolas at standard depth is taken as the interpolated value, and a function of their difference as an estimate of the interpolation error.

This function combined with the "**measurement error estimate**" comprises the "**combined measurement and interpolation error estimate**". It is expressed as a multiple of the standard deviation of measurement ( $\sigma$ ) under normal routine field conditions by:

## CANADIAN OCEANOGRAPHIC DATA CENTRE

[illegible]

$$\frac{\sigma_i}{\sigma} = \left\{ \frac{(\Delta V_i)^2}{\sigma^2} + \sum_{n=j-2}^{j+1} (\gamma_n)^2 \left( \frac{\sigma_n}{\sigma} \right)^2 \right\}^{1/2}, \text{ where}$$

- $\sigma_i$  = Standard deviation of the combined error estimates at standard oceanographic depth,  
 $\Delta V_i$  = the interpolation error estimate of variable "V" at standard oceanographic depth =  $1/3 (V_{i_1} - V_{i_2})$   
 $\gamma$  = Interpolation polynomial coefficient.  
 $Z_j$  = Observed depth.  
 $Z_i$  = Standard oceanographic depth, such that:  $Z_{j-2} < Z_{j-1} < Z_i < Z_j < Z_{j+1}$

The integral part of the fraction  $\frac{\sigma_i}{\sigma}$ , if  $\geq 2$ , is reported in this Data Record following the interpolated variable. It represents the **combined measurement and interpolation error estimate**. In order to distinguish it from an additional decimal digit, it is recorded alphabetically (e.g.: 2 as "B", 3 as "C", etc.).

With respect to the interpolated value of the salinity variable if reported to three decimal digits, the **interpolation error estimate** is given only when  $\frac{\sigma_i}{\sigma} \geq 2$  (the salinity is then recorded to two decimal places). If less than 2, the mean obtained from the two interpolation parabolas is reported to three decimal places.



## EXPLANATION OF DATA RECORD HEADINGS

MASTER HEADINGS

(1) C-REF-NO	(6) YR	(10) DEPTH	(15) WAVES 1	(20) AIR T	(25) VIS
(2) CONS. NO	(7) MONTH	(11) MXSAMPD	(16) WAVES 2	(21) WET B	(26) STN
(3) LAT	(8) DAY	(12) NO. DPTH	(17) WND-DIR	(22) WW-CODE	
(4) LON	(9) HR	(13) W-COLOR	(18) WND-FCE	(23) CLD-TPE	
(5) MARSD SQ		(14) W-TRNSP	(19) BARO	(24) CLD-AMT	(27) HW

(1) CRUISE REFER-  
ENCE NUMBER:

Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the C.R.N. was a number designated by C.O.D.C.

(2) CONSECUTIVE  
NUMBER:

Indicates the chronological order in which the stations were occupied.

## (3) LATITUDE:

Indicate the position of the platform at the time of observation

## (4) LONGITUDE:

(5) MARSDEN SQUARE: Designates the geographic area code (see Marsden square chart) in which the observation is located.

## (6) YEAR:

## (7) MONTH:

## (8) DAY:

## (9) HOUR:

The time (Greenwich Mean Time) at which the Master-card data were recorded.

It is reported to tenths of hours (Table 1).

If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.

## (10) DEPTH:

The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section II. Charted depths are denoted by the sounding value, preceded by the letter "C".

## (11) MAXIMUM

SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).

00 m - 50 m = 00

51 m - 150 m = 01

151 m - 250 m = 02

etc.



- (12) NUMBER OF DEPTHS: The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch cards).
- (13) WATER COLOUR: A code based on the percentage of yellow (see table 2 and NOTE under FIELD "14" below).
- (14) WATER TRANSPARENCY: The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;
- NOTE: The "GENERAL INFORMATION" chapter in section II of the data record will state which method was used.
- (15) WAVES 1  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (16) WAVES 2  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the predominant other-than wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (17) WIND DIRECTION: The true direction to the nearest 10 degrees from which the wind is blowing. Wind direction 990 means:—wind variable or direction unknown.
- (18) WIND FORCE  
(WND-FCE): Beaufort Notation (See Table 6).
- WIND SPEED  
(WND-SPD): Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section II.
- (19) BAROMETER: The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section II of the data record will state the type of instrument used.
- (20) AIR TEMPERATURE: In degrees Celsius.
- (21) WET BULB: In degrees Celsius.
- (22) ww CODE: Present Weather Code (See Table 7). Ref: WMO Code 4677
- (23) CLOUD TYPE: The type of predominating clouds (See Table 8). Ref: WMO Code 0500.
- (24) CLOUD AMOUNT: The sky coverage in eighths (See Table 9) Ref: WMO Code 2700
- (25) VISIBILITY: Visibility at the surface (See Table 10). Ref: WMO Code 4300.
- (26) STATION: A station reference number, assigned by the institute prior to, or during the survey.
- (27) HOURS AFTER HIGH WATER: Indicates the state of the tide for nearshore observations.

OBSERVED DATA HEADINGS

(1) GMT	(2) DEPTH	(3) TEMP	(4) SAL	(5) OXYGEN	(6) SGMT
(7) SOUND	(8) $PO_4$	(9) -P-	(10) $NO_2$	(11) $NO_3$	(12) $SiO_3$
				(13) pH.	

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

(1) G.M.T.: The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

(2) DEPTH: The depth in metres at the moment the oceanographic bottle reversed.

(3) TEMPERATURE: Temperatures from deepsea reversing thermometers, read to 0.01 °C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of this section. An alphabetical character following the Temperature value represents the measurement error estimate referred to in the INTRODUCTION to this section.

(4) SALINITY: Salinity as defined by:  $S = 0.03 + 1.805 C1\%$ , reported in:  
 a. 1/100 parts per 1000, or  
 b. 1/1000 parts per 1000.

In case a: an alphabetical character following the value is the measurement error estimate as referred to under (3)

In case b: no error estimate indication is provided for, but an additional decimal digit takes its place.

(5) OXYGEN: The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places. An alphabetical character following the value is the measurement error estimate as referred to under (3).

(6) SIGMA-T: The specific gravity anomaly as defined by:  $(\text{Specific gravity} - 1) \times 10^3$  (e.g.,  $\sigma_t$  reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).

(7) SOUND: The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.

- (8)  $\text{PO}_4$  Phosphate – Phosphorus reported to hundredths of microgram-atoms per litre.
- (9) -P- Total Phosphorus reported to hundredths of microgram-atoms per litre.
- (10)  $\text{NO}_2$  Nitrite-Nitrogen reported to hundredths of microgram-atoms per litre – No dissolved nitrogen included –
- (11)  $\text{NO}_3$  Nitrate-Nitrogen reported to tenths of microgram-atoms per litre.
- (12)  $\text{SiO}_3$  Silicate-Silicon reported in whole microgram-atoms per litre.
- (13) pH The pH value.

NOTE: "TRC" (trace) is reported when a chemical entry has a value smaller the standard deviation of measurement for that particular variable.

#### INTERPOLATED DATA HEADINGS

(1) DEPTH	(2) TEMP	(3) SAL	(4) OXYGEN	(5) SGMT	(6) SOUND
(7) DELTA-D	(8) POT-EN	(9) SVA.			

- (1) DEPTH: Standard Oceanographic Depth in whole metres, as well as additional depths: 125, 175, 225, 3500, 4500, 5500, 6500, 7500, 8500, 9500.
- (2) TEMPERATURE: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "INTRODUCTION" to section II of the data record).
- (3) SALINITY:
- A. The reported salinity values are observed to three decimal places.
    - (i) the interpolation error estimate is less than twice the standard deviation of measurement
      - the interpolated value is reported to three decimal places (e.g., 30.139).
    - (ii) the interpolation error estimate is equal to or greater than twice the standard deviation of measurement.
      - the interpolated value is reported to two decimal places, and followed by the **interpolation error estimate** (e.g., 29.23C).
  - B. The reported salinity values are observed to two decimal places and followed by the measurement error estimate.
    - the interpolated value is reported to two decimal places, and followed by the **combined measurement and interpolation error estimate** (e.g., 30.59B).
- (4) OXYGEN: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "Introduction" to section II of the data record).

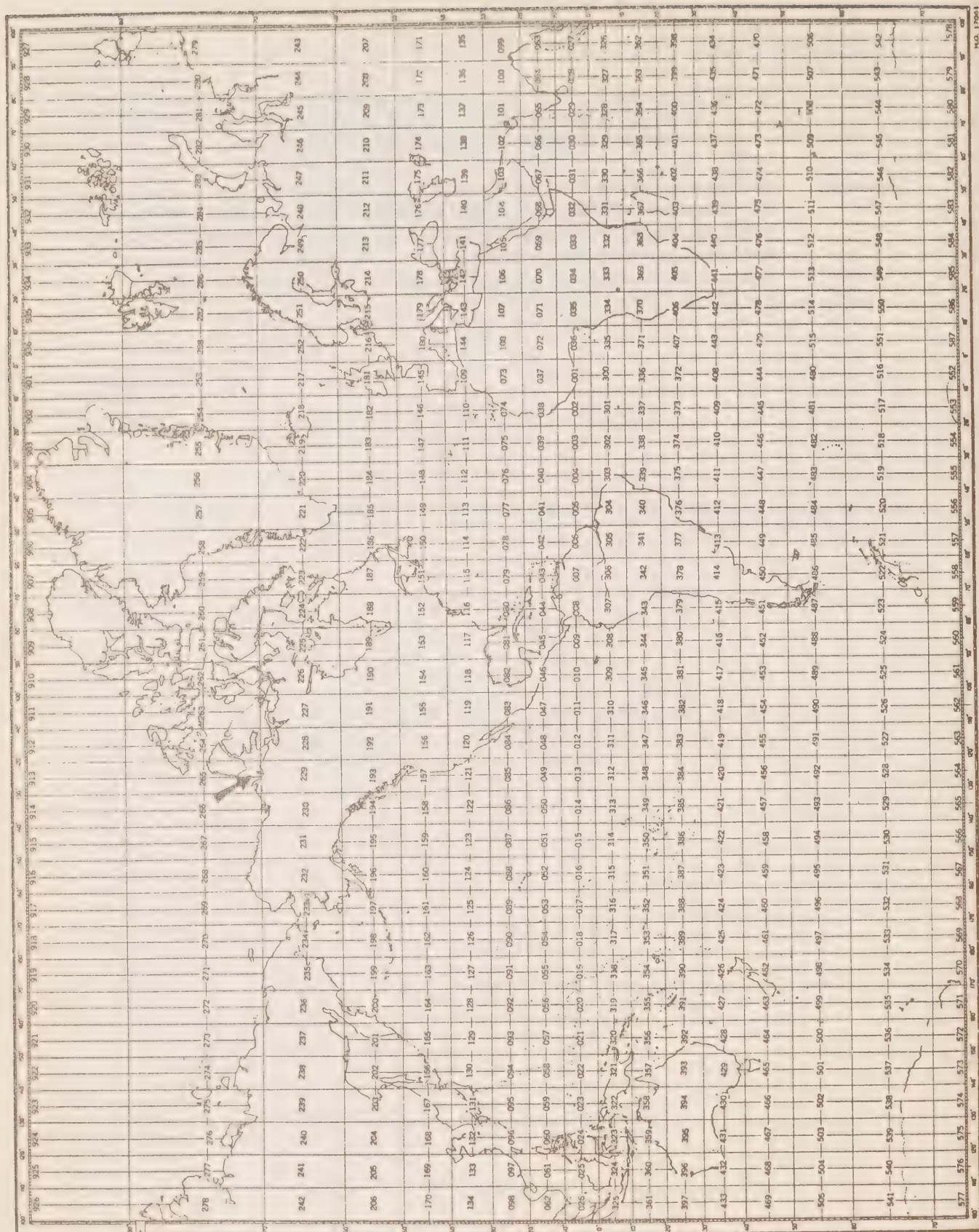
- (5) SIGMA-T: Computed from temperature and salinity values at standard oceanographic depth.
- (6) SOUND  
VELOCITY: Computed from temperature and salinity values at standard oceanographic depth, using Wilson's formula (1960).
- (7) DELTA-D: The geo-potential anomaly as defined by:
- $$\Delta D = \int_0^P \delta \rho dp$$
- $\Delta D$  is expressed in dynamic metres ( $10^5$  ergs/gram) and recorded to three decimal places (e.g., 2,345 dyn. metres).
- (8) POTENTIAL  
ENERGY  
ANOMALY: The Potential energy anomaly  $\chi$  as defined by:
- $$\chi = \frac{1}{g} \int_0^P p \delta \rho dp = \int_0^Z \rho p \delta dz$$
- $\chi$  is expressed in units of  $10^8$  ergs/cm<sup>2</sup> and recorded to two decimal places (e.g., 116.44).
- (9) SPECIFIC  
VOLUME  
ANOMALY: The specific volume anomaly as defined by:
- $$\delta = \alpha - \alpha_{35.0.P}$$
- $\delta$  is expressed in ml/gr, and conventionally reported as  $10^5 \delta$ , to one decimal place (i.e.,  $\delta$  reported as 1234, reads 123.4, and corresponds to a specific volume anomaly of 0.001234 ml/gr.).



## SPECIAL CHARACTERS

† (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs

\* (Asterisk): this character may occur in the **interpolated** portion of the data record. It is printed at the extreme left hand side of the page, when three or more standard depth levels fall within any one **observed depth interval**. The **third**, and all consequent levels within that interval are preceded by the asterisk to indicate that more than **two** machine interpolations were carried out, utilizing the same set of interpolation parabolas.



MARSDEN SQUARE CHART

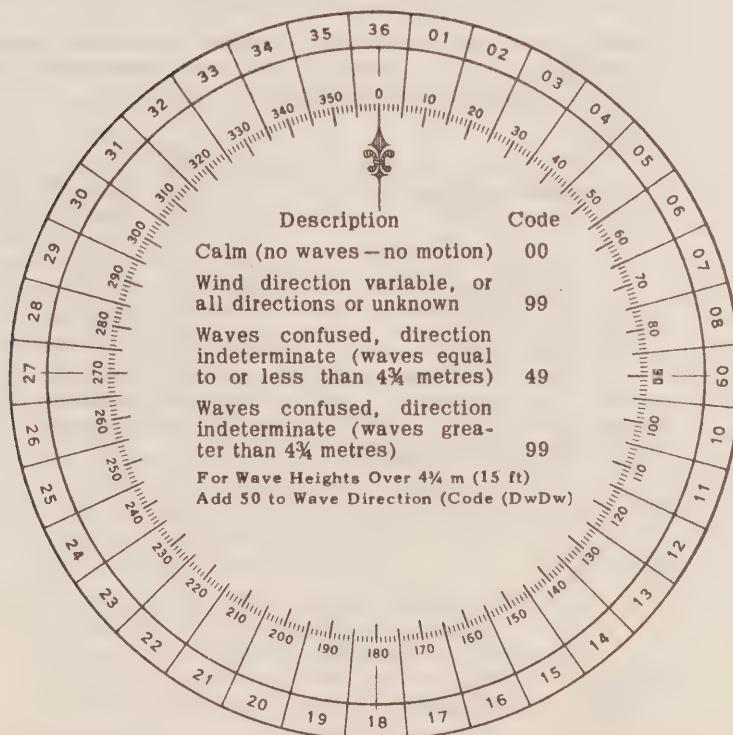
Table 1  
CONVERSION  
MINUTES TO  $\frac{1}{4}$  HRS.

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

Table 2  
WATER COLOR CODE  
Based on Percentage Yellow

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

Table 3. DIRECTION CODE (dd)



**NOTE:**

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.



**Table 4. PERIOD OF THE WAVES (Pw)**  
(Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

**Table 5. HEIGHT OF THE WAVES (Hw)**

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 =  $\frac{1}{4}$  m (1 ft) to  $\frac{3}{4}$  m ( $2\frac{1}{2}$  ft); 5 =  $2\frac{1}{4}$  m (7 ft) to  $2\frac{3}{4}$  m (9 ft); 9 =  $4\frac{1}{4}$  m ( $13\frac{1}{2}$  ft) to  $4\frac{3}{4}$  m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of  $2\frac{3}{4}$  m is reported by code figure 5.

Code			Code
0	Less than ¼ m (1 ft)	Add 50 to Dw Dw	0 5 m (16 ft)
1	½ m ( 1½ ft)		1 5½ m (17½ ft)
2	1 m ( 3 ft)		2 6 m (19 ft)
3	1½ m ( 5 ft)		3 6½ m (21 ft)
4	2 m ( 6½ ft)		4 7 m (22½ ft)
5	2½ m ( 8 ft)		5 7½ m (24 ft)
6	3 m ( 9½ ft)		6 8 m (25½ ft)
7	3½ m (11 ft)		7 8½ m (27 ft)
8	4 m (13 ft)		8 9 m (29 ft)
9	4½ m (14 ft)		9 9½ m (30½ ft) or more
x	Height not determined		



Table 6. WIND FORCE CODE

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane

Table 7. PRESENT WEATHER

W.W. CODE

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

Code figure		ww	
No meteors except photometeors	00	Cloud development not observed or not observable	characteristic change of the state of sky during the past hour
	01	Clouds generally dissolving or becoming less developed	
	02	State of sky on the whole unchanged	
	03	Clouds generally forming or developing	
Haze, dust, sand or smoke	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes	
	05	Haze	
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen	
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no dustorm or sandstorm	
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour	
	10	Mist	
	11	Patches of } shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea	
	12		More of less } continuous
	13	Lightning visible, no thunder heard	
	14	Precipitation within sight, not reaching the ground or the surface of the sea	
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station	
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	
	17	Thunderstorm, but no precepitation at the time of observation	
	18	Squalls	} at or within sight of the station during the preceding hour or at the time of observation
	19	Funnel clouds	

ww = 20 - 29	Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation	
20	Drizzle (not freezing) or snow grains	} not falling as shower(s)
21	Rain (not freezing)	
22	Snow	
23	Rain and snow or ice pellets, type (a)	
24	Freezing drizzle or freezing rain	
25	Shower(s) of rain	
26	Shower(s) of snow, or of rain and snow	
27	Shower(s) of hail, or of rain and hail	
28	Fog or ice fog	
29	Thunderstorm (with or without precipitation)	
ww = 30 - 39	Duststorm, sandstorm, drifting or blowing snow	
30	} Slight or moderate duststorm or sandstorm	-has decreased during the preceding hour
31		-no appreciable change during the preceding hour
32		-has begun or has increased during the preceding hour
33	} Severe duststorm or sandstorm	-has decreased during the preceding hour
34		-no appreciable change during the preceding hour
35		-has begun or has increased during the preceding hour
36	Slight or moderate blowing snow	} generally low (below eye level)
37	Heavy drifting snow	
38	Slight or moderate blowing snow	} generally high (above eye level)
39	Heavy blowing snow	
ww = 40 - 49	Fog or ice fog at the time of observation	
40	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer	
41	Fog or ice fog in patches	
42	Fog or ice fog, sky visible	} has become thinner during the preceding hour
43	Fog or ice fog, sky invisible	
44	Fog or ice fog, sky visible	} no appreciable change during the preceding hour
45	Fog or ice fog, sky invisible	
46	Fog or ice fog, sky visible	} has begun or has become thicker during the preceding hour
47	Fog or ice fog, sky invisible	
48	Fog, depositing rime, sky visible	
49	Fog, depositing rime, sky invisible	

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

## ww = 50 - 59 Drizzle

- |    |  |   |                                      |
|----|--|---|--------------------------------------|
| 50 | Drizzle, not freezing, intermittent          | { | slight at time of observation        |
| 51 | Drizzle, not freezing, continuous            |   |                                      |
| 52 | Drizzle, not freezing, intermittent          | { | moderate at time of observation      |
| 53 | Drizzle, not freezing, continuous            |   |                                      |
| 54 | Drizzle, not freezing, intermittent          | { | heavy (dense) at time of observation |
| 55 | Drizzle, not freezing, continuous            |   |                                      |
| 56 | Drizzle, freezing, slight                    |   |                                      |
| 57 | Drizzle, freezing, moderate or heavy (dense) |   |                                      |
| 58 | Drizzle and rain, slight                     |   |                                      |
| 59 | Drizzle and rain, moderate or heavy          |   |                                      |

## ww = 60 - 69 Rain

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 60 | Rain, not freezing, intermittent            | { | slight at time of observation   |
| 61 | Rain, not freezing, continuous              |   |                                 |
| 62 | Rain, not freezing, intermittent            | { | moderate at time of observation |
| 63 | Rain, not freezing, continuous              |   |                                 |
| 64 | Rain, not freezing, intermittent            | { | heavy at time of observation    |
| 65 | Rain, not freezing, continuous              |   |                                 |
| 66 | Rain, freezing, slight                      |   |                                 |
| 67 | Rain, freezing, moderate or heavy           |   |                                 |
| 68 | Rain or drizzle and snow, slight            |   |                                 |
| 69 | Rain or drizzle and snow, moderate or heavy |   |                                 |

## 70 - 79 Solid precipitation not in showers

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 70 | Intermittent fall of snow flakes                      | { | slight at time of observation   |
| 71 | Continuous fall of snow flakes                        |   |                                 |
| 72 | Intermittent fall of snow flakes                      | { | moderate at time of observation |
| 73 | Continuous fall of snow flakes                        |   |                                 |
| 74 | Intermittent fall of snow flakes                      | { | heavy at time of observation    |
| 75 | Continuous fall of snow flakes                        |   |                                 |
| 76 | Ice prisms (with or without fog)                      |   |                                 |
| 77 | Snow grains (with or without fog)                     |   |                                 |
| 78 | Isolated starlike snow crystals (with or without fog) |   |                                 |
| 79 | Ice pellets, type (a)                                 |   |                                 |

## ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

- |    |  |   |   |
|----|--|---|---|
| 80 | Rain shower(s), slight   |   |   |
| 81 | Rain shower(s), moderate or heavy  |   |   |
| 82 | Rain shower(s), violent  |   |   |
| 83 | Shower(s) of rain and snow mixed, slight   |   |   |
| 84 | Shower(s) of rain and snow mixed, moderate or heavy  |   |   |
| 85 | Snow shower(s), slight   |   |   |
| 86 | Snow shower(s), moderate or heavy  |   |   |
| 87 | Shower(s) of snow pellets or ice pellets, type (b), with or without rain                         | { | - slight  |
| 88 | or rain and snow mixed   |   |   |
| 89 | Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder      | { | - moderate or heavy   |
| 90 |  |   |   |
| 91 | Slight rain at time of observation   | { | thunderstorm during the preceding hour but not at time of observation |
| 92 | Moderate or heavy rain at time of observation  |   |   |
| 93 | Slight snow, or rain and snow mixed or hail at time of observation                               | { | thunderstorm at time of observation                                   |
| 94 | Moderate or heavy snow, or rain and snow mixed or hail at time of observation                    |   |   |
| 95 | Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation | { |   |
| 96 | Thunderstorm, slight or moderate, with hail at time of observation                               |   |   |
| 97 | Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation              | { |   |
| 98 | Thunderstorm, combined with duststorm or sandstorm at time of observation                        |   |   |
| 99 | Thunderstorm, heavy, with hail at time of observation  |   |   |

## PRECIPITATION ON STATION AT TIME OF OBSERVATION



Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus ..... Ci	5	Nimbostratus ..... Ns
1	Cirrocumulus ..... Cc	6	Stratocumulus ..... Sc
2	Cirrostratus ..... Cs	7	Stratus ..... St
3	Alto cumulus ..... Ac	8	Cumulus ..... Cu
4	Altostratus ..... As	9	Cumulonimbus ..... Cb
X	Cloud not visible owing to darkness, fog, dust storm, sand storm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta =  $\frac{1}{8}$  of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
90	Less than 50 metres (less than 55 yards)
91	50-200 metres (approx. 55-220 yards)
92	200-500 metres (approx. 220-550 yards)
93	500-1,000 metres (approx. 550 yards- $\frac{1}{2}$ n.m.)
94	1-2 km (approx. $\frac{1}{2}$ -1 n.m.)
95	2-4 km (approx. 1-2 n.m.)
96	4-10 km (approx. 2-6 n.m.)
97	10-20 km (approx. 6-12 n.m.)
98	20-50 km (approx. 12-30 n.m.)
99	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile



GENERAL INFORMATION

Institute: Arctic Unit, Montreal.

Observation platform: M. V. "Salvelinus"

Vessels' cruising speed: 9 knots

Total number of stations occupied: 14

Air temperature: Was observed from a fixed thermometer.

Surface sea water temperature: Was obtained using a reversing thermometer giving in-situ temperatures to 1/100° C.

The following Standard Deviations were used to express both measurement and interpolation error estimates:

<u>Temperature:</u>	0.02
<u>Salinity:</u>	0.003
<u>Oxygen:</u>	Not available



### SECTION III

Serial oceanographic data





C-REF-NO 002	YR 1963	DEPTH 36	WAVES 1	XX	AIR T	VIS
CONS. NO 001	MONTH 7	MXSAMPD 00	WAVES 2	XX	WET B	STN 004
LAT 70-062N	DAY 24	NO.DPTH 6	WND-DIR		WW-CODE	
LON 125-090W	HR 21.0	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
213	0000	0742	30279	840	2368	14745
213	0005	0397	31165	790	2477	14617
213	0010	0160	31750	810	2542	14522
210	0015	0073	31755	796	2548	14484
210	0020	0079	31922	794	2561	14490
210	0030	-0103	32507	750	2616	14415

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0742	30279		2368	14745	0000	00000	4229
0010	0160	31750		2542	14522	0034	00001	2565
0020	0079	31922		2561	14490	0059	00005	2387
0030	-0103	32507		2616	14415	0080	00010	1864

C-REF-NO 002	YR 1963	DEPTH 182	WAVES 1	XX	AIR T	VIS
CONS. NO 002	MONTH 7	MXSAMPD 02	WAVES 2	XX	WET B	STN 006
LAT 70-037N	DAY 26	NO.DPTH 11	WND-DIR		WW-CODE	
LON 126-000W	HR 01.5	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
022	0000	1052	28665	584	2196	14842
022	0005	0612	29292	780	2306	14681
022	0007	0193	30748	771	2460	14523
022	0010	0030	31009	711	2490	14453
018	0015	-0061	31284	681	2516	14415
018	0020	-0080	31890	730	2565	14416
018	0030	-0109	32256	645	2596	14409
018	0050	-0137	32338	609	2603	14400
015	0075		32837	550		
015	0150	-0139	33371	542	2687	14430
015	0178	-0080	34025	549	2738	14472

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1052	28665		2196	14842	0000	00000	5870
0010	0030	31009		2490	14453	0045	00002	3061
0020	-0080	31890		2565	14416	0072	00006	2345
0030	-0109	32256		2596	14409	0094	00011	2055
0050	-0137	32338		2603	14400	0135	00028	1983
0075	-0164 B	32837		2644	14399	0180	00056	1591
0100	-0173 C	3300 I		2657	14401	0218	00090	1465
0125	-0165 B	3318 I		2671	14411	0253	00131	1328
0150	-0139	33371		2687	14430	0285	00175	1183
0175	-0087	3398 G		2734	14468	0309	00215	0736

C-REF-NO 002	YR 1963	DEPTH 13	WAVES 1	XX	AIR T	VIS
CONS. NO 003	MONTH 7	MXSAMPD 00	WAVES 2	XX	WET B	STN 007
LAT 69-229N	DAY 30	NO.DPTH 6	WND-DIR		WW-CODE	
LON 125-405W	HR 03.3	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
038	0000	0789	29215	660	2278	14750
037	0003	0789	29228	660	2279	14751
036	0005	0789	28546	660	2226	14742
035	0007	0784	29365	660	2290	14751
034	0010	0415	29555	618	2347	14604
033	0012	0410	30243	670	2402	14611

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0789	29215		2278	14750	0000	00000	5084
0010	0415	29555		2347	14604	0048	00002	4421

C-REF-NO 002	YR 1963	DEPTH 19	WAVES 1	XX	AIR T	VIS
CONS. NO 004	MONTH 7	MXSAMPD 00	WAVES 2	XX	WET B	STN 007
LAT 69-229N	DAY 31	NO.DPTH 5	WND-DIR		WW-CODE	
LON 125-405W	HR 23.5	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
236	0000	0618	29730	650	2340	14689
235	0005	0621	29865	650	2350	14692
235	0010	0623	29698	650	2337	14692
235	0015	0559	29954	656	2364	14670
235	0018	0498	30376	680	2404	14651

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0618	29730		2340	14689	0000	00000	4492
0010	0623	29698		2337	14692	0045	00002	4522



C-REF-NO 002	YR 1963	DEPTH 15	WAVES 1	XX	AIR T	VIS
CONS. NO 005	MONTH 8	MXSAMPD 00	WAVES 2	XX	WET B	STN 009
LAT 69-393N	DAY 01	NO.DPTH 4	WND-DIR		WW-CODE	
LON 125-223W	HR 21.5	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
215	0000	0518	29928	693	2367	14650
215	0005	0495	30976	690	2452	14655
215	0010	0489	29960	675	2372	14640
215	0014	0490	29820	659	2361	14639

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0518	29928		2367	14650	0000	00000	4236
0010	0489	29960		2372	14640	0042	00002	4184

C-REF-NO 002	YR 1963	DEPTH 185	WAVES 1	XX	AIR T	VIS
CONS. NO 006	MONTH 8	MXSAMPD 02	WAVES 2	XX	WET B	STN 011
LAT 70-058N	DAY 03	NO.DPTH 11	WND-DIR		WW-CODE	
LON 126-025W	HR 12.8	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
134	0000	0513	29127	656	2304	14637
133	0005	0532	29786	649	2354	14655
133	0010	0513		636		
133	0015	0518		636		
133	0020	0436	30446	700	2416	14626
133	0030	-0022	32033	745	2575	14447
128	0050	-0131	32558	639	2621	14406
128	0075	-0142	32842	570	2644	14409
128	0100	-0154	33095	585	2665	14411
128	0150	-0141	34596	590	2786	14447
128	0180	-0152	34007	495	2739	14438

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0513	29127		2304	14637	0000	00000	4835
0010	0513	3000 I		2373	14651	0045	00002	4177
0020	0436	30446		2416	14626	0085	00008	3767
0030	-0022	32033		2575	14446	0115	00016	2255
0050	-0131	32558		2621	14406	0156	00032	1816
0075	-0142	32842		2644	14409	0199	00059	1593
0100	-0154	33095		2665	14411	0237	00092	1394
0125	-0148 B	3396 I		2734	14430	0264	00122	0734
0150	-0141	34596		2786	14447	0276	00139	0246
0175	-0152	3405 I		2742	14438	0287	00159	0658

C-REF-NO 002	YR 1963	DEPTH 81	WAVES 1	XX	AIR T	VIS
CONS. NO 007	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 012
LAT 70-039N	DAY 04	NO.DPTH 10	WND-DIR		WW-CODE	
LON 125-285W	HR 20.8	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
213	0000	0703	26630	643	2087	14683
213	0005	0657		636		
213	0010	0552	29277	620	2312	14657
213	0015	0566	29749	600	2347	14670
213	0020	0546	29942	656	2365	14665
208	0030	0314	30949	690	2467	14582
208	0045	0171		688		
208	0050	0017	31888	528	2561	14466
208	0075	-0073	32349	641	2602	14435
208	0080	-0051	32467	604	2611	14447

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0703	26630		2087	14683	0000	00000	6917
0010	0552	29277		2312	14657	0059	00002	4762
0020	0546	29942		2365	14665	0104	00009	4256
0030	0314	30949		2467	14582	0142	00019	3282
0050	0017	31888		2561	14466	0199	00041	2382
0075	-0073	32349		2602	14435	0254	00076	1992

C-REF-NO 002	YR 1963	DEPTH 180	WAVES 1	XX	AIR T	VIS
CONS. NO 008	MONTH 8	MXSAMPD 02	WAVES 2	XX	WET B	STN 014
LAT 70-179N	DAY 06	NO.DPTH 11	WNO-DIR		WW-CODE	
LON 123-550W	HR 03.8	W-COLOR	WNO-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
050	0000	0583	29971	600	2363	14677
050	0005	0579	29935	623	2361	14676
045	0010	0576	30005	755	2366	14677
045	0015	0448	30515	742	2420	14631
045	0020	0168	31287	642	2505	14521
045	0030	-0029	31823	640	2558	14440
038	0049	-0074	32368	665	2604	14430
038	0073	-0118	32638	615	2627	14417
038	0098	-0144	32917	581	2650	14413
038	0147		33093	564		
050	0166	-0127	33266	562	2678	14437

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0583	29971		2363	14677	0000	00000	4272
0010	0576	30005		2366	14677	0043	00002	4240
0020	0168	31287		2505	14521	0079	00007	2922
0030	-0029	31823		2558	14440	0106	00014	2413
0050	-0076	32384		2605	14430	0150	00032	1966
0075	-0121	32663		2629	14417	0196	00061	1736
0100	-0146	3293 B		2651	14412	0237	00098	1526
0125	-0154	3302 I		2659	14414	0275	00141	1449
0150	-0143	3318 I		2671	14426	0310	00190	1330



C-REF-NO 002	YR 1963	DEPTH 64	WAVES 1	XX	AIR T	VIS
CONS. NO 009	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 015
LAT 70-114N	DAY 08	NO.DPTH 8	WND-DIR		WW-CODE	
LON 124-167W	HR 03.3	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
037	0000	0731	28863	668	2258	14723
037	0005	0678	29135	615	2286	14706
037	0010	0595	29827	625	2350	14682
033	0015	0585	29899	610	2357	14680
033	0020	0578	29968	610	2363	14679
033	0030	0567	30089	612	2374	14677
033	0050	0126	31562	690	2529	14511
033	0063	-0052	32194	730	2589	14440

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0731	28863		2258	14723	0000	00000	5274
0010	0595	29827		2350	14682	0049	00002	4394
0020	0578	29968		2363	14679	0092	00009	4270
0030	0567	30089		2374	14677	0134	00020	4168
0050	0126	31562		2529	14511	0203	00046	2687

C-REF-NO 002	YR 1963	DEPTH 82	WAVES 1	XX	AIR T	VIS
CONS. NO 010	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 019
LAT 69-497N	DAY 13	NO.DPTH 9	WND-DIR		WW-CODE	
LON 123-055W	HR 00.5	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
008	0000	0824	28286	601	2201	14752
008	0005	0713	29346	605	2298	14723
008	0010	0567	30200	615	2383	14676
008	0015	0516	30549	650	2416	14660
005	0020	0522	31731	663	2509	14679
005	0030	0458	30723	686	2436	14641
005	0050	0338	31028	701	2471	14597
005	0075	0233	32638	723	2608	14577
005	0080	0219	32545	708	2602	14571

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0824	28286		2201	14752	0000	00000	5824
0010	0567	30200		2383	14676	0050	00002	4083
0020	0522	31731		2509	14679	0085	00007	2886
0030	0458	30723		2436	14641	0117	00016	3580
0050	0338	31028		2471	14597	0186	00043	3243
0075	0233	32638		2608	14577	0251	00083	1942

C-REF-NO 002	YR 1963	DEPTH 59	WAVES 1	XX	AIR T	VIS
CONS. NO 011	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 020
LAT 69-399N	DAY 13	NO.DPTH 8	WND-DIR		WW-CODE	
LON 123-335W	HR 04.2	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
044	0000	0763	28882		2255	14735
044	0005	0701	29132		2283	14715
044	0010	0593	30048		2368	14684
044	0015	0565	30310		2392	14677
042	0020	0562	30343		2395	14677
042	0030	0544	30417		2403	14672
042	0050	0493	30597		2422	14657
042	0058	0444	30696		2435	14639

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0763	28882		2255	14735	0000	00000	5300
0010	0593	30048		2368	14684	0048	00002	4226
0020	0562	30343		2395	14677	0089	00008	3971
0030	0544	30417		2403	14672	0129	00019	3897
0050	0493	30597		2422	14657	0205	00050	3711

C-REF-NO 002	YR 1963	DEPTH 31	WAVES 1	XX	AIR T	VIS
CONS. NO 012	MONTH 8	MXSAMPD 00	WAVES 2	XX	WET B	STN 022
LAT 69-270N	DAY 14	NO.DPTH 6	WNO-DIR		WN-CODE	
LON 124-170W	HR 01.3	W-COLOR	WNO-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
015	0000	0783	28988	665	2261	14745
013	0005	0720		650		
013	0010	0708	29638	650	2322	14725
013	0015	0683	29744	655	2333	14717
013	0020	0624	29980	651	2359	14698
013	0030	0583	30169	650	2379	14685

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0783	28988		2261	14745	0000	00000	5246
0010	0708	29638		2322	14725	0050	00002	4667
0020	0624	29980		2359	14698	0095	00009	4312
0030	0583	30169		2379	14685	0137	00020	4126



C-REF-NO 002	YR 1963	DEPTH 78	WAVES 1	XX	AIR T	VIS
CONS. NO 013	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 025
LAT 69-520N	DAY 20	NO.DPTH 9	WND-DIR		WW-CODE	
LON 125-540W	HR 23.1	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 229		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
233	0000	0787		635		
235	0005	0774	22430	608	1750	14658
235	0010	0773	22370	625	1745	14658
235	0015	0641	24100	620	1895	14627
235	0020	0606	25130	620	1980	14627
231	0030	0566	28634	700	2260	14658
231	0050	0110	32104	728	2574	14511
231	0060	-0045	31423	732	2526	14432
237	0075	-0108	32628	620	2626	14422

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0787							
0010	0773	22370		1745	14658	0101	00005	10203
0020	0606	25130		1980	14627	0192	00018	7943
0030	0566	28634		2260	14658	0258	00035	5261
0050	0110	32104		2574	14511	0333	00062	2265
0075	-0108	32628		2626	14422	0384	00094	1767

C-REF-NO 002	YR 1963	DEPTH 70	WAVES 1	XX	AIR T	VIS
CONS. NO 014	MONTH 8	MXSAMPD 01	WAVES 2	XX	WET B	STN 032
LAT 70-143N	DAY 28	NO.DPTH 9	WND-DIR		WW-CODE	
LON 124-344W	HR 19.8	W-COLOR	WND-SPD		CLD-TPE	
MARSD SQ 265		W-TRNSP	BARO		CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
202	0000	0695	23740	655	1861	14642
202	0005	0677	23830	655	1870	14637
202	0010	0683	25170	655	1975	14657
202	0015	0540	29380	655	2321	14654
198	0020	0536	29878	650	2361	14660
198	0030	0308	30767	713	2453	14577
198	0040	0015	31545	735	2534	14458
202	0050	-0079	32163	700	2587	14425
198	0065	-0094	32348	690	2603	14423

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0695	23740		1861	14642	0000	00000	9084
0010	0683	25170		1975	14657	0085	00004	7993
0020	0536	29878		2361	14660	0147	00013	4294
0030	0308	30767		2453	14577	0186	00022	3415
0050	-0079	32163		2587	14425	0242	00044	2134

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CANADA

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TO  
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**No. 3**

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615 Booth Street, Ottawa 4

Data Record

SOUTHERN LABRADOR to NORTHERN GRAND BANK

(C.O.D.C. Reference: C.R.N. 324)

No. 3

1964 Data Record Series

Programmed by the Canadian Committee on Oceanography

FISHERIES RESEARCH BOARD OF CANADA

Southern Labrador to Northern Grand Bank

Ship:	M. V. "Investigator II"
Local cruise designation:	004
Cruise period:	July 24 - August 4, 1962
Observers:	Mr. A. P. Cowan
	Mr. J. Mullins
	Mr. C. Robbins

BIOLOGICAL STATION - St. John's Newfoundland



## **SECTION I**

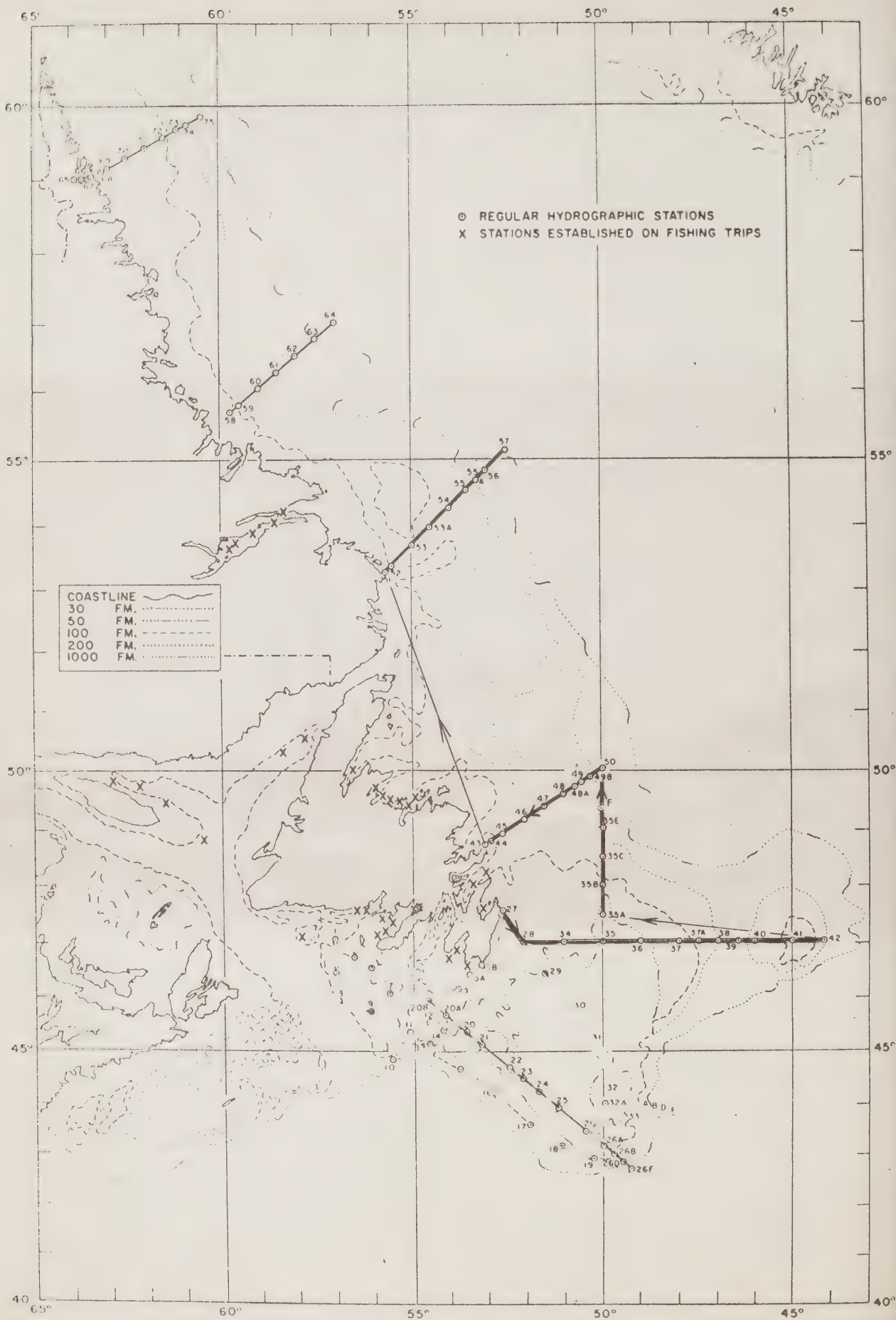
**Description of data collection procedures**



"INVESTIGATOR II"



Fisheries Research Board



TRACK CHART



## INTRODUCTION

Oceanographic stations were occupied in an area from St. John's to Flemish Cap and northward to Southern Labrador (see track chart) to obtain physical oceanographic data, including bathythermograph data.

## EXTRACT OF CRUISE LOG

Departed from St. John's on July 24, returned to St. John's on August 4, 1962. Surface temperatures were unusually low for the season due to the lack of sunshine and exceptionally low air temperatures.

## OBSERVATION PROCEDURES

At each station sub-surface water samples were taken from surface to bottom (or greatest depth to 1000 metres) using one or more casts of Nansen reversing water bottles. The bottles were reversed as close to standard oceanographic depths as possible. A B.T. cast was taken at the start of each station and checked with thermometer readings.

Bottles were allowed to soak for six minutes before releasing messenger. All thermometer readings were checked by second person and any doubtful readings were checked using different thermometers.

Surface water samples for salinity determination were obtained with a bucket. The surface temperature was measured in this bucket sample with an armoured thermometer graduated at 0.5°C intervals.

## LABORATORY PROCEDURES

Temperatures were corrected by use of temperature correction charts. Metre wheel readings were corrected by use of unprotected thermometer readings and wire angle tables to arrive at the accepted depths.

Salinity results were obtained by titration methods, using silver nitrate as a standard solution.

## BATHYTHERMOGRAPH DATA

These may be obtained from the Bedford Institute of Oceanography, Dartmouth, N.S.

Refer to B.T. Cruise No. INV.-36.

PERSONNEL

- |     |  |   |
|-----|--|---|
| (1) | A.P. Cowan<br>J. Mullins<br>C. Robbins | Sea Observers                             |
| (2) | A.G. Kelland<br>G. Kean                | Technicians engaged in<br>laboratory work |

## SECTION II

Description of the machine-generated data record





## INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation cycle.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. If interpolations are carried out, additional derived quantities are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct-image masters. These masters subsequently yield the required volume of copies for distribution.

Provision has been made to enter an "estimate of precision" for each observed variable selected for interpolation at the standard oceanographic depth. The precision depends on the instrument or technique used to determine the variable.

A standard precision stated as a **standard deviation** ( $\sigma$ ) can be determined for each instrument or technique under routine field conditions by making duplicate determinations of the variables for a homogeneous sample of sea water. These standard deviations are given for each cruise under "GENERAL INFORMATION" of section II of the data record.

The **measurement error estimate** of a specific observation in this data record, is stated as a multiple of the standard deviation derived as above, and entered in a column immediately to the right of the reported variable. In order to distinguish it from an additional decimal digit, the measurement error estimate is recorded alphabetically, (i.e.,  $1\sigma = A$ ,  $2\sigma = B$ , etc.; in this data record "A" is suppressed).

An option is provided with respect to the measurement of the salinity variable. If observed to three decimal digits, the last digit takes the place of the measurement error estimate.

In the past, a number of methods for both manual and machine interpolation have been developed. Studies and comparisons of the several methods have shown that no single method is universally acceptable. The manual methods are the most elaborate and flexible, but often require subjective decisions. In machine interpolation, all the present methods fail to yield acceptable results under some circumstances. Hence, it is considered necessary to qualify interpolated values by stating an "**interpolation error estimate**" derived from the particular interpolation formula used. There are two purposes in stating the error estimates; **first**, to give an indication of the quality of interpolated data; **second**, to allow the oceanographer to redesign his observational procedures in order to reduce interpolation errors in future observations.

The interpolation scheme chosen for the OCEANS II program consists of a combination of two 3-point interpolations using the Lagrangian interpolation polynomial, as recommended by Rattray (1962). A parabola is fitted through three values of a given variable (T, S,  $O_2$ ) considered as a function of depth. The two interpolation parabolas require a total of four points (observed depths). The middle points are common to both parabolas. The average of the two values obtained from the parabolas at standard depth is taken as the interpolated value, and a function of their difference as an estimate of the interpolation error.

This function combined with the "measurement error estimate" comprises the "**combined measurement and interpolation error estimate**". It is expressed as a multiple of the standard deviation of measurement ( $\sigma$ ) under normal routine field conditions by:

## CANADIAN OCEANOGRAPHIC DATA CENTRE

[illegible]

$$\frac{\sigma_i}{\sigma} = \left\{ \frac{(\Delta V_i)^2}{\sigma^2} + \sum_{n=j-2}^{j+1} (\gamma_n)^2 \left( \frac{\sigma_n}{\sigma} \right)^2 \right\}^{1/2}, \text{ where}$$

- $\sigma_i$  = Standard deviation of the combined error estimates at standard oceanographic depth,  
 $\Delta V_i$  = the interpolation error estimate of variable "V" at standard oceanographic depth =  $1/3 (V_{i_1} - V_{i_2})$   
 $\gamma$  = Interpolation polynomial coefficient.  
 $Z_j$  = Observed depth.  
 $Z_i$  = Standard oceanographic depth, such that:  $Z_{j-2} < Z_{j-1} < Z_i < Z_j < Z_{j+1}$

The integral part of the fraction  $\frac{\sigma_i}{\sigma}$ , if  $\geq 2$ , is reported in this Data Record following the interpolated variable. It represents the **combined measurement and interpolation error estimate**. In order to distinguish it from an additional decimal digit, it is recorded alphabetically (e.g.: 2 as "B", 3 as "C", etc.).

With respect to the interpolated value of the salinity variable if reported to three decimal digits, the **interpolation error estimate** is given only when  $\frac{\sigma_i}{\sigma} \geq 2$  (the salinity is then recorded to two decimal places). If less than 2, the mean obtained from the two interpolation parabolas is reported to three decimal places.



## EXPLANATION OF DATA RECORD HEADINGS

## MASTER HEADINGS

(1) C-REF-NO	(6) YR	(10) DEPTH	(15) WAVES 1	(20) AIR T	(25) VIS
(2) CONS. NO	(7) MONTH	(11) MXSAMPD	(16) WAVES 2	(21) WET B	(26) STN
(3) LAT	(8) DAY	(12) NO. DPTH	(17) WND-DIR	(22) WW-CODE	
(4) LON	(9) HR	(13) W-COLOR	(18) WND-FCE	(23) CLD-TPE	
(5) MARSD SQ		(14) W-TRNSP	(19) BARO	(24) CLD-AMT	(27) HW

- (1) CRUISE REFERENCE NUMBER: Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the C.R.N. was a number designated by C.O.D.C.
- (2) CONSECUTIVE NUMBER: Indicates the chronological order in which the stations were occupied.
- (3) LATITUDE: Indicate the position of the platform at the time of observation
- (4) LONGITUDE:
- (5) MARSDEN SQUARE: Designates the geographic area code (see Marsden square chart) in which the observation is located.
- (6) YEAR:
- (7) MONTH:
- (8) DAY:
- (9) HOUR: The time (Greenwich Mean Time) at which the Master-card data were recorded.  
It is reported to tenths of hours (Table 1).  
If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.
- (10) DEPTH: The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section II. Charted depths are denoted by the sounding value, preceded by the letter "C".
- (11) MAXIMUM SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).  
00 m - 50 m = 00  
51 m - 150 m = 01  
151 m - 250 m = 02  
etc.



- (12) NUMBER OF DEPTHS: The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch cards).
- (13) WATER COLOUR: A code based on the percentage of yellow (see table 2 and NOTE under FIELD "14" below).
- (14) WATER TRANSPARENCY: The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;
- NOTE: The "GENERAL INFORMATION" chapter in section II of the data record will state which method was used.
- (15) WAVES 1  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (16) WAVES 2  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the predominant other-than wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (17) WIND DIRECTION: The true direction to the nearest 10 degrees from which the wind is blowing. Wind direction 990 means:—wind variable or direction unknown.
- (18) WIND FORCE  
(WND-FCE): Beaufort Notation (See Table 6).
- WIND SPEED  
(WND-SPD): Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section II.
- (19) BAROMETER: The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section II of the data record will state the type of instrument used.
- (20) AIR TEMPERATURE: In degrees Celsius.
- (21) WET BULB: In degrees Celsius.
- (22) ww CODE: Present Weather Code (See Table 7). Ref: WMO Code 4677
- (23) CLOUD TYPE: The type of predominating clouds (See Table 8). Ref: WMO Code 0500.
- (24) CLOUD AMOUNT: The sky coverage in eighths (See Table 9) Ref: WMO Code 2700
- (25) VISIBILITY: Visibility at the surface (See Table 10). Ref: WMO Code 4300.
- (26) STATION: A station reference number, assigned by the institute prior to, or during the survey.
- (27) HOURS AFTER HIGH WATER: Indicates the state of the tide for nearshore observations.

## OBSERVED DATA HEADINGS

(1) GMT	(2) DEPTH	(3) TEMP	(4) SAL	(5) OXYGEN	(6) SGMT
(7) SOUND	(8) $PO_4$	(9) -P-	(10) $NO_2$	(11) $NO_3$	(12) $SiO_2$
					(13) pH.

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

(1) G.M.T.: The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

(2) DEPTH: The depth in metres at the moment the oceanographic bottle reversed.

(3) TEMPERATURE: Temperatures from deepsea reversing thermometers, read to 0.01° C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of this section. An alphabetical character following the Temperature value represents the measurement error estimate referred to in the INTRODUCTION to this section.

(4) SALINITY: Salinity as defined by:  $S = 0.03 + 1.805 C1\%$ , reported in:

- a. 1/100 parts per 1000, or
- b. 1/1000 parts per 1000.

In case a: an alphabetical character following the value is the measurement error estimate as referred to under (3)

In case b: no error estimate indication is provided for, but an additional decimal digit takes its place.

(5) OXYGEN: The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places.

An alphabetical character following the value is the measurement error estimate as referred to under (3).

(6) SIGMA-T: The specific gravity anomaly as defined by:  $(\text{Specific gravity} - 1) \times 10^3$  (e.g.,  $\sigma_t$  reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).

(7) SOUND: The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.

- (8)  $\text{PO}_4$  Phosphate – Phosphorus reported to hundredths of microgram-atoms per litre.
- (9) -P- Total Phosphorus reported to hundredths of microgram-atoms per litre.
- (10)  $\text{NO}_2$  Nitrite-Nitrogen reported to hundredths of microgram-atoms per litre – No dissolved nitrogen included –
- (11)  $\text{NO}_3$  Nitrate-Nitrogen reported to tenths of microgram-atoms per litre.
- (12)  $\text{SiO}_2$  Silicate-Silicon reported in whole microgram-atoms per litre.
- (13) pH The pH value.

NOTE: "TRC" (trace) is reported when a chemical entry has a value smaller the standard deviation of measurement for that particular variable.

#### INTERPOLATED DATA HEADINGS

(1) <i>DEPTH</i>	(2) <i>TEMP</i>	(3) <i>SAL</i>	(4) <i>OXYGEN</i>	(5) <i>SGMT</i>	(6) <i>SOUND</i>
(7) <i>DELTA-D</i>	(8) <i>POT-EN</i>	(9) <i>SVA</i>			

- (1) DEPTH: Standard Oceanographic Depth in whole metres, as well as additional depths: 125, 175, 225, 3500, 4500, 5500, 6500, 7500, 8500, 9500.
- (2) TEMPERATURE: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "INTRODUCTION" to section II of the data record).
- (3) SALINITY:
- A. The reported salinity values are observed to three decimal places.
    - (i) the interpolation error estimate is less than twice the standard deviation of measurement
      - the interpolated value is reported to three decimal places (e.g., 30.139).
    - (ii) the interpolation error estimate is equal to or greater than twice the standard deviation of measurement.
      - the interpolated value is reported to two decimal places, and followed by the **interpolation error estimate** (e.g., 29.23C).
  - B. The reported salinity values are observed to two decimal places and followed by the measurement error estimate.
    - the interpolated value is reported to two decimal places, and followed by the **combined measurement and interpolation error estimate** (e.g., 30.59B).
- (4) OXYGEN: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "Introduction" to section II of the data record).

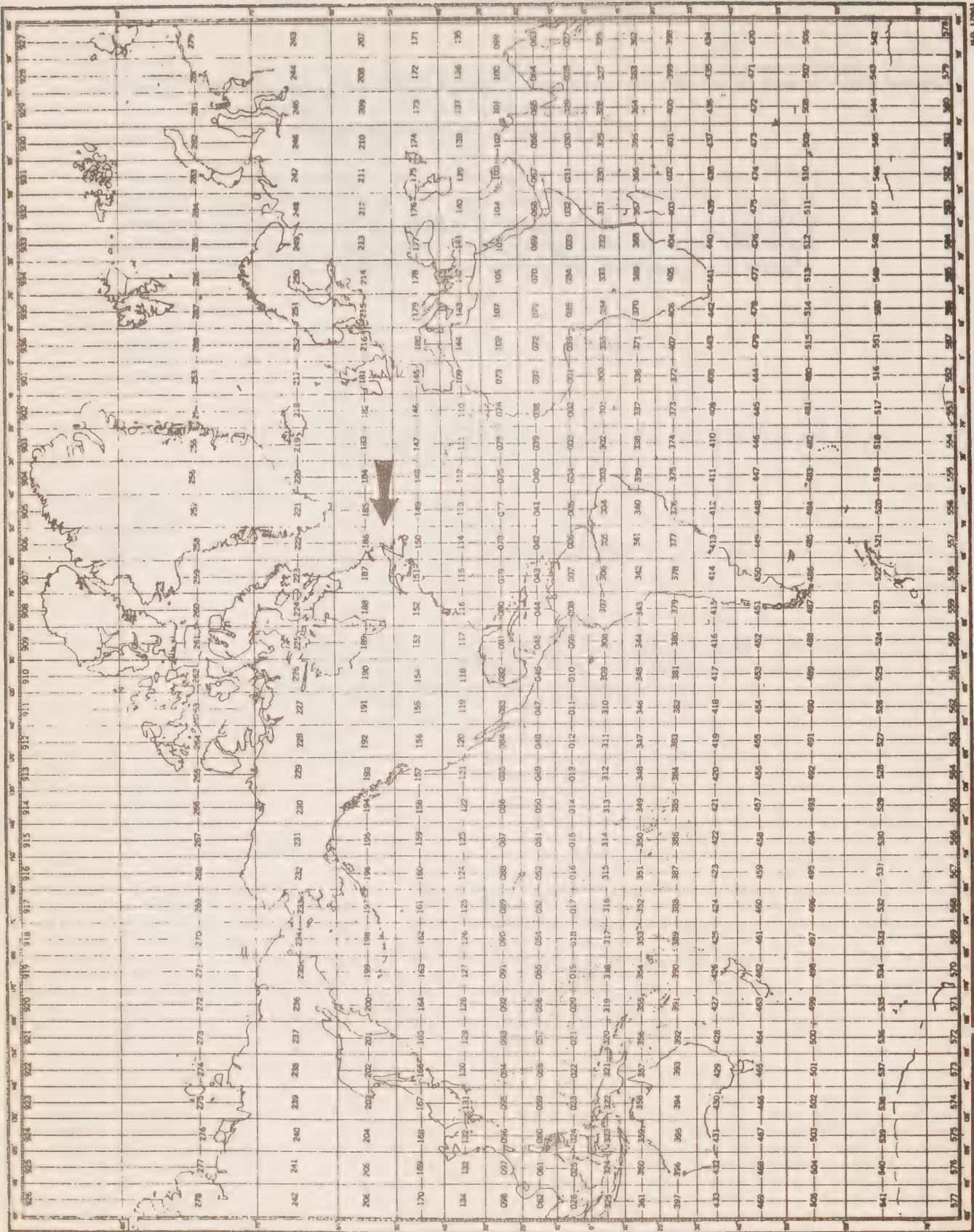
- (5) SIGMA-T: Computed from temperature and salinity values at standard oceanographic depth.
- (6) SOUND VELOCITY: Computed from temperature and salinity values at standard oceanographic depth, using Wilson's formula (1960).
- (7) DELTA-D: The geo-potential anomaly as defined by:
- $$\Delta D = \int_0^P \delta dp$$
- $\Delta D$  is expressed in dynamic metres ( $10^5$  ergs/gram) and recorded to three decimal places (e.g., 2,345 dyn. metres).
- (8) POTENTIAL ENERGY ANOMALY: The Potential energy anomaly  $\chi$  as defined by:
- $$\chi = \frac{1}{g} \int_0^P p \delta dp = \int_0^Z \rho p \delta dz$$
- $\chi$  is expressed in units of  $10^8$  ergs/cm<sup>2</sup> and recorded to two decimal places (e.g., 116.44).
- (9) SPECIFIC VOLUME ANOMALY: The specific volume anomaly as defined by:
- $$\delta = \alpha - \alpha_{35.0.P}$$
- $\delta$  is expressed in ml/gr, and conventionally reported as  $10^5 \delta$ , to one decimal place (i.e.,  $\delta$  reported as 1234, reads 123.4, and corresponds to a specific volume anomaly of 0.001234 ml/gr.).



## SPECIAL CHARACTERS

‡ (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs

\* (Asterisk): this character may occur in the **interpolated** portion of the data record. It is printed at the extreme left hand side of the page, when three or more standard depth levels fall within any one **observed depth interval**. The **third**, and all consequent levels within that interval are preceded by the asterisk to indicate that more than **two** machine interpolations were carried out, utilizing the same set of interpolation parabolas.



MARSDEN SQUARE CHART

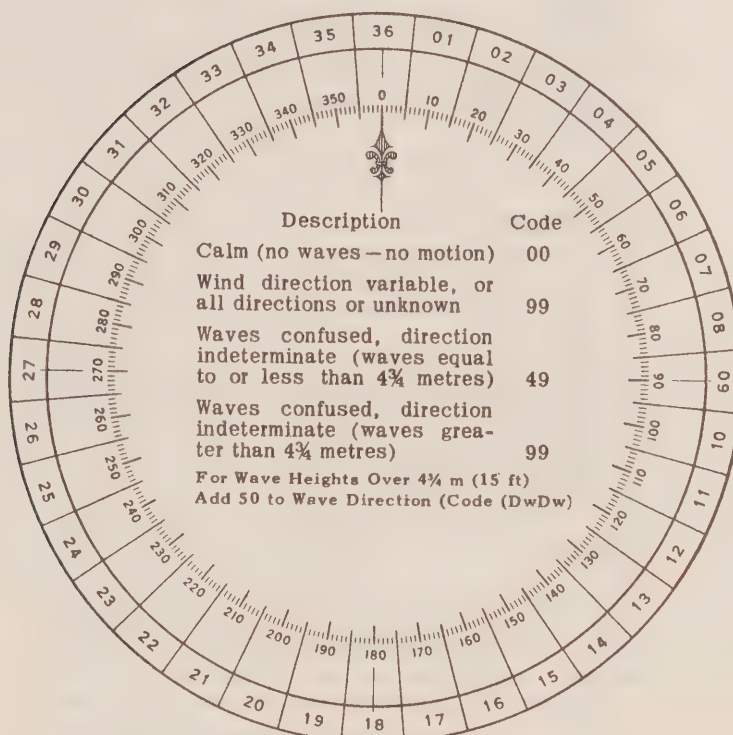
**Table 1**  
**CONVERSION**  
**MINUTES TO  $\frac{1}{10}$  HRS.**

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

**Table 2**  
**WATER COLOR CODE**  
**Based on Percentage Yellow**

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

**Table 3. DIRECTION CODE (dd)**



**NOTE:**

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.



**Table 4. PERIOD OF THE WAVES (Pw)**  
(Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

**Table 5. HEIGHT OF THE WAVES (Hw)**

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 =  $\frac{1}{4}$  m (1 ft) to  $\frac{3}{4}$  m ( $2\frac{1}{2}$  ft); 5 =  $2\frac{1}{4}$  m (7 ft) to  $2\frac{3}{4}$  m (9 ft); 9 =  $4\frac{1}{4}$  m ( $13\frac{1}{2}$  ft) to  $4\frac{3}{4}$  m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of  $2\frac{3}{4}$  m is reported by code figure 5.

Code			Code
0	Less than ¼ m (1 ft)	Add 50 to Dw Dw	0 5 m (16 ft)
1	½ m ( 1½ ft)		1 5½ m (17½ ft)
2	1 m ( 3 ft)		2 6 m (19 ft)
3	1½ m ( 5 ft)		3 6½ m (21 ft)
4	2 m ( 6½ ft)		4 7 m (22½ ft)
5	2½ m ( 8 ft)		5 7½ m (24 ft)
6	3 m ( 9½ ft)		6 8 m (25½ ft)
7	3½ m (11 ft)		7 8½ m (27 ft)
8	4 m (13 ft)		8 9 m (29 ft)
9	4½ m (14 ft)		9 9½ m (30½ ft) or more
x	Height not determined		



Table 6. WIND FORCE CODE

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane

Table 7. PRESENT WEATHER

W.W. CODE

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

Code figure			
ww			
No meteors except photometers	00	Cloud development not observed or not observable	
	01	Clouds generally dissolving or becoming less developed	
	02	State of sky on the whole unchanged	
	03	Clouds generally forming or developing	
Haze, dust, sand or smoke	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes	
	05	Haze	
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen	
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no dustorm or sandstorm	
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour	
	10	Mist	
	11	Patches of	shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea
	12	More or less continuous	
	13	Lightning visible, no thunder heard	
	14	Precipitation within sight, not reaching the ground or the surface of the sea	
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station	
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	
	17	Thunderstorm, but no precepitation at the time of observation	
	18	Squalls	at or within sight of the station during the preceding hour or at the time of observation
	19	Funnel clouds	

ww = 20 - 29	Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation	
20	Drizzle (not freezing) or snow grains	not falling as shower (s)
21	Rain (not freezing)	
22	Snow	
23	Rain and snow or ice pellets, type (a)	
24	Freezing drizzle or freezing rain	
25	Shower (s) of rain	
26	Shower (s) of snow, or of rain and snow	
27	Shower (s) of hail, or of rain and hail	
28	Fog or ice fog	
29	Thunderstorm (with or without precipitation)	
ww = 30 - 39	Duststorm, sandstorm, drifting or blowing snow	
30	Slight or moderate duststorm or sandstorm	-has decreased during the preceding hour
31		-no appreciable change during the preceding hour
32		-has begun or has increased during the preceding hour
33	Severe duststorm or sandstorm	-has decreased during the preceding hour
34		-no appreciable change during the preceding hour
35		-has begun or has increased during the preceding hour
36	Slight or moderate blowing snow	generally low (below eye level)
37	Heavy drifting snow	
38	Slight or moderate blowing snow	generally high (above eye level)
39	Heavy blowing snow	
ww = 40 - 49	Fog or ice fog at the time of observation	
40	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer	
41	Fog or ice fog in patches	
42	Fog or ice fog, sky visible	has become thinner during the preceding hour
43	Fog or ice fog, sky invisible	
44	Fog or ice fog, sky visible	no appreciable change during the preceding hour
45	Fog or ice fog, sky invisible	
46	Fog or ice fog, sky visible	has begun or has become thicker during the preceding hour
47	Fog or ice fog, sky invisible	
48	Fog, depositing rime, sky visible	
49	Fog, depositing rime, sky invisible	

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

## ww = 50 - 59 Drizzle

50	Drizzle, not freezing, intermittent	} slight at time of observation
51	Drizzle, not freezing, continuous	
52	Drizzle, not freezing, intermittent	} moderate at time of observation
53	Drizzle, not freezing, continuous	
54	Drizzle, not freezing, intermittent	} heavy (dense) at time of observation
55	Drizzle, not freezing, continuous	
56	Drizzle, freezing, slight	
57	Drizzle, freezing, moderate or heavy (dense)	
58	Drizzle and rain, slight	
59	Drizzle and rain, moderate or heavy	

## ww = 60 - 69 Rain

60	Rain, not freezing, intermittent	} slight at time of observation
61	Rain, not freezing, continuous	
62	Rain, not freezing, intermittent	} moderate at time of observation
63	Rain, not freezing, continuous	
64	Rain, not freezing, intermittent	} heavy at time of observation
65	Rain, not freezing, continuous	
66	Rain, freezing, slight	
67	Rain, freezing, moderate or heavy	
68	Rain or drizzle and snow, slight	
69	Rain or drizzle and snow, moderate or heavy	

## 70 - 79 Solid precipitation not in showers

ww		
70	Intermittent fall of snow flakes	} slight at time of observation
71	Continuous fall of snow flakes	
72	Intermittent fall of snow flakes	} moderate at time of observation
73	Continuous fall of snow flakes	
74	Intermittent fall of snow flakes	} heavy at time of observation
75	Continuous fall of snow flakes	
76	Ice prisms (with or without fog)	
77	Snow grains (with or without fog)	
78	Isolated starlike snow crystals (with or without fog)	
79	Ice pellets, type (a)	

## ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

80	Rain shower(s), slight	
81	Rain shower(s), moderate or heavy	
82	Rain shower(s), violent	
83	Shower(s) of rain and snow mixed, slight	
84	Shower(s) of rain and snow mixed, moderate or heavy	
85	Snow shower(s), slight	
86	Snow shower(s), moderate or heavy	
87	Shower(s) of snow pellets or ice pellets, type (b), with or without rain or rain and snow mixed	} - slight
88	Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder	
89	Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder	} - moderate or heavy
90	Slight rain at time of observation	
91	Moderate or heavy rain at time of observation	} thunderstorm during the preceding hour but not at time of observation
92	Slight snow, or rain and snow mixed or hail at time of observation	
93	Moderate or heavy snow, or rain and snow mixed or hail at time of observation	} - moderate or heavy
94	Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation	
95	Thunderstorm, slight or moderate, with hail at time of observation	} thunderstorm at time of observation
96	Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation	
97	Thunderstorm, combined with duststorm or sandstorm at time of observation	} - moderate or heavy
98	Thunderstorm, heavy, with hail at time of observation	
99	Thunderstorm, heavy, with hail at time of observation	

## PRECIPITATION ON STATION AT TIME OF OBSERVATION



Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus ..... Ci	5	Nimbostratus ..... Ns
1	Cirrocumulus ..... Cc	6	Stratocumulus ..... Sc
2	Cirrostratus ..... Cs	7	Stratus ..... St
3	Alto cumulus ..... Ac	8	Cumulus ..... Cu
4	Altostratus ..... As	9	Cumulonimbus ..... Cb
X	Cloud not visible owing to darkness, fog, dust storm, sand storm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta =  $\frac{1}{8}$  of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
90	Less than 50 metres (less than 55 yards)
91	50-200 metres (approx. 55-220 yards)
92	200-500 metres (approx. 220-550 yards)
93	500-1,000 metres (approx. 550 yards- $\frac{1}{2}$ n.m.)
94	1-2 km (approx. $\frac{3}{4}$ -1 n.m.)
95	2-4 km (approx. 1-2 n.m.)
96	4-10 km (approx. 2-6 n.m.)
97	10-20 km (approx. 6-12 n.m.)
98	20-50 km (approx. 12-30 n.m.)
99	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile



GENERAL INFORMATION

Institute: Biological Station, St. John's Newfoundland

Observation platform: M. V. "Investigator II"

Vessel's cruising speed: 9 knots

Total number of stations occupied: 37

Barometer readings: Were obtained using an Aneroid Carometer and are not corrected.

Air temperature: Was observed from a sling psychrometer.

Wet bulb temperature: Was observed from a sling psychrometer.

Surface sea water temperature: Was obtained from a bucket sample using a deck thermometer.

The following Standard Deviations were used to express both measurement and interpolation error estimates:

Temperature	0.09
Salinity	0.08



### SECTION III

Serial oceanographic data





C-REF-NO 004	YR 1962	DEPTH 175	WAVES 1	AIR T 13.3	VIS
CONS. NO 001	MONTH 7	MXSAMPD 02	WAVES 2	WET B 13.0	STN 027
LAT 47-328N	DAY 24	NO.DPTH 9	WND-DIR 140	WW-CODE 03	
LON 52-352W	HR 15.1	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1049.7	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
151	0000	107	3142		2407	14884
151	0010	0971	3144		2425	14849
151	0020	0324	3198		2548	14599
151	0030	0071	3230		2592	14493
151	0050	-0058	3272		2631	14443
151	0075	-0137	3284		2644	14412
151	0100	-0128	3297		2654	14422
151	0150	-0108	3315		2668	14442
151	0172	-0074	3330		2679	14463

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1070	3142		2407	14884	0000	00000	3856
0010	0971	3144		2425	14849	0038	00002	3686
0020	0324	3198		2548	14599	0069	00006	2510
0030	0071	3230		2592	14493	0092	00012	2094
0050	-0058	3272		2631	14443	0131	00028	1715
0075	-0137	3284		2644	14411	0172	00054	1596
0100	-0128	3297		2654	14422	0211	00089	1497
0125	-0123	3305		2660	14429	0248	00131	1434
0150	-0108	3315		2668	14442	0283	00181	1363

C-REF-NO 004	YR 1962	DEPTH 136	WAVES 1	AIR T 12.2	VIS
CONS. NO 002	MONTH 7	MXSAMPD 01	WAVES 2	WET B 10.8	STN 028
LAT 47-000N	DAY 24	NO.DPTH 8	WND-DIR 160	WW-CODE 02	
LON 52-020W	HR 20.3	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1016.5	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
203	0000	099	3221		2481	14865
203	0010	0954	3221		2487	14853
203	0020	0929	3221		2491	14845
203	0030	0382	3261		2593	14634
203	0050	0030	3290		2642	14486
203	0075	-0015	3308		2659	14472
203	0100	-0054	3315		2666	14459
203	0133	-0065	3335		2683	14462

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0990	3221		2481	14865	0000	00000	3143
0010	0954	3221		2487	14853	0031	00002	3089
0020	0929	3221		2491	14845	0062	00006	3053
0030	0382	3261		2593	14634	0088	00013	2086
0050	0030	3290		2642	14486	0125	00028	1616
0075	-0015	3308		2659	14472	0164	00052	1456
0100	-0054	3315		2666	14459	0200	00084	1385
0125	-0064	3331		2679	14460	0233	00122	1256

C-REF-NO 004	YR 1962	DEPTH 102	WAVES 1	AIR T 12.2	VIS
CONS. NO 003	MONTH 7	MXSAMPD 01	WAVES 2	WET B 11.6	STN 034
LAT 47-000N	DAY 25	NO.DPTH 7	WND-DIR 180	WW-CODE 62	
LON 51-000W	HR 02.0	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1013.8	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
020	0000	104	3225		2476	14883
020	0010	0963	3230		2493	14857
020	0020	0941	3230		2496	14851
020	0030	0522	3239		2561	14689
020	0048	0214	3268		2613	14565
020	0073	0039	3294		2645	14494
020	0091	0037	3306		2655	14498

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1040	3225		2476	14883	0000	00000	3193
0010	0963	3230		2493	14857	0031	00002	3036
0020	0941	3230		2496	14851	0062	00006	3004
0030	0522	3239		2561	14689	0089	00013	2392
0050	0191	3271		2617	14555	0132	00030	1859
0075	0022	3296		2648	14487	0175	00057	1563

C-REF-NO 004	YR 1962	DEPTH 82	WAVES 1	AIR T	VIS
CONS. NO 004	MONTH 7	MXSAMPD 01	WAVES 2	WET B 11.3	STN 035
LAT 47-000N	DAY 25	NO.DPTH 7	WND-DIR 220	WW-CODE 51	
LON 50-000W	HR 07.8	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1013.2	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
078	0000	105	3274		2513	14893
078	0010	1034	3274		2515	14889
078	0020	1025	3275		2518	14887
078	0030	0826	3277		2551	14815
078	0050	0407	3277		2603	14650
078	0075	0088	3303		2649	14518
078	0080	0085	3303		2649	14517

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1050	3274		2513	14893	0000	00000	2847
0010	1034	3274		2515	14889	0029	00001	2823
0020	1025	3275		2518	14887	0057	00006	2803
0030	0826	3277		2551	14815	0083	00013	2488
0050	0407	3277		2603	14650	0128	00031	1991
0075	0088	3303		2649	14518	0173	00058	1548



C-REF-NO 004	YR 1962	DEPTH 83	WAVES 1	AIR T	VIS
CONS. NO 005	MONTH 7	MXSAMPD 01	WAVES 2	WET B 11.9	STN 036
LAT 47-000N	DAY 25	NO.DPTH 7	WND-DIR 220	WW-CODE 45	
LON 49-000W	HR 11.8	W-COLOR	WND-FCE 03	CLO-TPE	
MARSD SQ 149		W-TRNSP	BARO 1012.5	CLO-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	096	3263		2519	14859
118	0010	0939	3263		2522	14853
118	0020	0931	3263		2524	14851
118	0030	0671	3266		2564	14753
118	0050	0165	3277		2623	14545
118	0075	0022	3301		2651	14488
118	0081	0020	3304		2654	14488

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0960	3263		2519	14859	0000	00000	2785
0010	0939	3263		2522	14853	0028	00001	2755
0020	0931	3263		2524	14851	0056	00006	2744
0030	0671	3266		2564	14753	0081	00012	2363
0050	0165	3277		2623	14545	0123	00029	1793
0075	0022	3301		2651	14488	0165	00055	1527

C-REF-NO 004	YR 1962	DEPTH 136	WAVES 1	AIR T	VIS
CONS. NO 006	MONTH 7	MXSAMPD 01	WAVES 2	WET B 11.1	STN 037
LAT 47-000N	DAY 25	NO.DPTH 8	WND-DIR 220	WW-CODE 45	
LON 48-000W	HR 16.5	W-COLOR	WND-FCE 03	CLD-TPE	
MARSD SQ 149		W-TRNSP	BARO 1014.5	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
165	0000	089	3227		2502	14828
165	0010	0879	3227		2504	14826
165	0020	0859	3229		2508	14820
165	0030	0272	3256		2599	14586
165	0050	-0017	3299		2651	14465
165	0075	-0101	3319		2671	14433
165	0100	-0034	3337		2683	14471
165	0134	0062	3369		2704	14525

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0890	3227		2502	14828	0000	00000	2947
0010	0879	3227		2504	14826	0030	00002	2933
0020	0859	3229		2508	14820	0059	00006	2890
0030	0272	3256		2599	14586	0084	00012	2030
0050	-0017	3299		2651	14465	0119	00026	1525
0075	-0101	3319		2671	14433	0155	00049	1339
0100	-0034	3337		2683	14471	0188	00078	1226
0125	0016	3361		2700	14502	0217	00111	1069

C-REF-NO 004	YR 1962	DEPTH 188	WAVES 1	AIR T	VIS
CONS. NO 007	MONTH 7	MXSAMPD 02	WAVES 2	WET B 10.2	STN 37A
LAT 47-000N	DAY 25	NO.DPTH 9	WND-DIR 220	WW-CODE 45	
LON 47-300W	HR 19.4	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 149		W-TRNSP	BARO 1015.9	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
194	0000	091	3203		2480	14832
194	0010	0820	3203		2494	14800
194	0020	0751	3218		2515	14777
194	0030	0319	3279		2613	14609
194	0050	-0083	3303		2657	14435
194	0075	-0127	3321		2673	14421
194	0100	-0042	3337		2683	14467
194	0150	0045	3372		2707	14520
194	0185	0106	3400		2726	14558

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0910	3203		2480	14832	0000	00000	3155
0010	0820	3203		2494	14800	0031	00002	3027
0020	0751	3218		2515	14777	0060	00006	2823
0030	0319	3279		2613	14609	0084	00012	1895
0050	-0083	3303		2657	14435	0118	00025	1469
0075	-0127	3321		2673	14421	0153	00048	1315
0100	-0042	3337		2683	14467	0185	00076	1222
0125	0008	3354		2695	14497	0215	00110	1116
0150	0045	3372		2707	14520	0241	00147	0998
0175	0095	3392		2720	14550	0265	00187	0878

C-REF-NO 004	YR 1962	DEPTH		WAVES 1		AIR T		VIS
CONS. NO 008	MONTH 7	MXSAMPD	07	WAVES 2		WET B	08.6	STN 038
LAT 47-000N	DAY 25	NO.DPTH	15	WND-DIR	220	WW-CODE	45	
LON 47-000W	HR 22.7	W-COLOR		WND-FCE	02	CLD-TPE		
MARSD SQ 149		W-TRNSP		BARD		CLD-AMT	9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
227	0000	070	3205		2512	14752
227	0010	0704	3209		2515	14756
227	0020	0610	3290		2590	14730
227	0030	0566	3306		2608	14716
227	0050	0226	3327		2659	14579
227	0075	0041	3362		2699	14505
227	0100	0118	3402		2727	14549
227	0150	0200	3449		2759	14600
227	0200	0273	3449		2752	14640
227	0250	0315	3470		2765	14670
227	0300	0317	3474		2768	14679
227	0370	0341	3476		2768	14701
227	0460	0350	3481		2771	14721
227	0550	0358	3481		2770	14739
227	0750	0347	3485		2774	14768

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0700	3205		2512	14752	0000	00000	2852
0010	0704	3209		2515	14756	0029	00001	2828
0020	0610	3290		2590	14730	0053	00005	2108
0030	0566	3306		2608	14716	0074	00010	1938
0050	0226	3327		2659	14579	0108	00024	1458
0075	0041	3362		2699	14505	0140	00044	1072
0100	0118	3402		2727	14549	0164	00065	0814
0125	0166	3431		2747	14579	0182	00085	0627
0150	0200	3449		2759	14600	0196	00105	0519
0175	0239	3451		2757	14622	0210	00128	0540
0200	0273	3449		2752	14640	0224	00155	0583
0225	0298	3459		2758	14657	0238	00186	0530
0250	0315	3470		2765	14670	0250	00216	0467
0300	0317	3474		2768	14679	0273	00281	0442
0400	0345	3478		2769	14708	0318	00443	0450
0500	0354	3481		2771	14729	0363	00651	0442
0600	0356	3484		2772	14747	0408	00902	0434
0700	0352	3485		2774	14762	0451	01194	0429



C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 009	MONTH 7	MXSAMPD	07	WAVES 2	WET B 09.7	STN 039
LAT 47-000N	DAY 26	NO.DPTH	15	WND-DIR 220	WW-CODE 50	
LON 46-300W	HR 04.3	W-COLOR		WND-FCE 01	CLD-TPE	
MARSD SQ 149		W-TRNSP		BARO 1019.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
043	0000	093	3346		2589	14858
043	0010	0929	3348		2590	14860
043	0020	0830	3351		2608	14825
043	0030	0214	3366		2691	14575
043	0050	0283	3407		2718	14614
043	0075	0205	3420		2735	14586
043	0091	0316	3445		2745	14640
043	0140	0297	3458		2757	14642
043	0190	0342	3469		2762	14671
043	0240	0381	3478		2765	14697
043	0290	0375	3478		2766	14703
043	0390	0391	3488		2772	14727
043	0495	0379	3488		2773	14740
043	0595	0363	3488		2775	14750
043	0748	0356	3490		2777	14772

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0930	3346		2589	14858	0000	00000	2124
0010	0929	3348		2590	14860	0021	00001	2109
0020	0830	3351		2608	14825	0042	00004	1942
0030	0214	3366		2691	14575	0057	00008	1153
0050	0283	3407		2718	14614	0078	00016	0899
0075	0205	3420		2735	14586	0099	00029	0739
0100	0330 B	3451		2749	14649	0116	00044	0612
0125	0328 C	3459		2756	14653	0130	00061	0550
0150	0304	3460		2759	14647	0144	00080	0521
0175	0325	3466		2761	14661	0157	00102	0501
0200	0352	3471		2763	14677	0169	00126	0489
0225	0372	3476		2764	14691	0181	00152	0476
0250	0381	3478		2765	14699	0193	00181	0470
0300	0376	3479		2766	14705	0217	00248	0465
0400	0391	3488		2772	14729	0261	00407	0419
0500	0378	3488		2773	14740	0304	00603	0417
0600	0366	3488		2775	14752	0346	00839	0410
0700	0358	3489		2777	14765	0387	01114	0403

C-REF-NO 004	YR 1962	DEPTH 325	WAVES 1	AIR T	VIS
CONS. NO 010	MONTH 7	MXSAMPD 03	WAVES 2	WET B 09.7	STN 040
LAT 47-000N	DAY 26	NO.DPTH 12	WND-DIR 220	WW-CODE 52	
LON 46-000W	HR 08.3	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 149		W-TRNSP	BARO 1019.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
083	0000	091	3313		2566	14847
083	0010	0918	3335		2582	14854
083	0020	0922	3335		2581	14857
083	0030	0957	3342		2581	14873
083	0050	0398	3394		2697	14662
083	0075	0156	3411		2731	14563
083	0100	0270	3449		2753	14623
083	0145	0444	3474		2755	14707
083	0195	0380	3474		2762	14689
083	0245	0397	3479		2764	14705
083	0295	0420	3488		2769	14724
083	0320	0405	3488		2771	14722

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0910	3313		2566	14847	0000	00000	2338
0010	0918	3335		2582	14854	0023	00001	2189
0020	0922	3335		2581	14857	0045	00005	2197
0030	0957	3342		2581	14873	0067	00010	2201
0050	0398	3394		2697	14662	0100	00023	1102
0075	0156	3411		2731	14563	0124	00037	0771
0100	0270	3449		2753	14623	0141	00052	0574
0125	0383	3468		2757	14678	0155	00068	0538
0150	0442	3475		2756	14707	0169	00088	0551
0175	0417 B	3476		2759	14701	0182	00110	0521
0200	0380	3474		2762	14690	0195	00135	0494
0225	0385	3477		2764	14696	0207	00162	0485
0250	0401	3480		2765	14707	0219	00191	0477
0300	0411	3487		2769	14721	0243	00257	0443

C-REF-NO 004	YR 1962	DEPTH 159	WAVES 1	AIR T	VIS
CONS. NO 011	MONTH 7	MXSAMPD 02	WAVES 2	WET B 11.6	STN 041
LAT 47-000N	DAY 26	NO.DPTH 8	WND-DIR 090	WW-CODE 43	
LON 45-000W	HR 13.2	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 149		W-TRNSP	BARO 1022.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
132	0000	113	3377		2578	14935
132	0010	1112	3382		2586	14931
132	0020	1054	3387		2600	14912
132	0030	0985	3389		2613	14889
132	0050	0658	3396		2668	14768
132	0075	0665	3414		2681	14778
132	0100	0413	3429		2723	14681
132	0155	0405	3458		2747	14691

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1130	3377		2578	14935	0000	00000	2221
0010	1112	3382		2586	14931	0022	00001	2155
0020	1054	3387		2600	14912	0043	00004	2022
0030	0985	3389		2613	14889	0063	00009	1897
0050	0658	3396		2668	14768	0096	00022	1379
0075	0665	3414		2681	14778	0129	00043	1257
0100	0413	3429		2723	14681	0156	00067	0858
0125	0464 G	3444		2729	14708	0177	00091	0805
0150	0414 B	3456		2744	14693	0195	00117	0663

C-REF-NO 004	YR 1962	DEPTH 503	WAVES 1	AIR T	VIS
CONS. NO 012	MONTH 7	MXSAMPD 05	WAVES 2	WET B 11.6	STN 042
LAT 47-000N	DAY 26	NO.DPTH 13	WND-DIR 090	WW-CODE 47	
LON 43-540W	HR 20.0	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 149		W-TRNSP	BARO 1023.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
200	0000	112	3371		2576	14930
200	0010	1065	3371		2585	14913
200	0020	1024	3433		2641	14907
200	0030	0814	3438		2679	14831
200	0050	0500	3447		2728	14711
200	0075	0370	3451		2745	14662
200	0100	0360	3465		2757	14663
200	0150	0365	3474		2764	14675
200	0200	0365	3474		2764	14683
200	0250	0391	3479		2765	14703
200	0300	0375	3488		2774	14706
200	0400	0367	3488		2775	14719
200	0500	0357	3487		2775	14731

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1120	3371		2576	14930	0000	00000	2248
0010	1065	3371		2585	14913	0022	00001	2157
0020	1024	3433		2641	14907	0041	00004	1633
0030	0814	3438		2679	14831	0056	00008	1274
0050	0500	3447		2728	14711	0077	00016	0810
0075	0370	3451		2745	14662	0095	00027	0648
0100	0360	3465		2757	14663	0110	00040	0535
0125	0361	3472		2762	14669	0123	00055	0488
0150	0365	3474		2764	14675	0135	00072	0477
0175	0364	3474		2764	14679	0147	00093	0476
0200	0365	3474		2764	14683	0159	00116	0481
0225	0379	3476		2764	14694	0171	00142	0483
0250	0391	3479		2765	14703	0184	00172	0475
0300	0375	3488		2774	14706	0205	00233	0395
0400	0367	3488		2775	14719	0245	00377	0396
0500	0357	3487		2775	14731	0286	00564	0402



C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 013	MONTH 7	MXSAMPD	10	WAVES 2	WET B 11.9	STN 42A
LAT 47-000N	DAY 26	NO.DPTH	16	WND-DIR 040	WW-CODE 43	
LON 43-280W	HR 23.8	W-COLOR		WND-FCE 01	CLD-TPE	
MARSD SQ 149		W-TRNSP		BARO 1024.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
238	0000	116	3436		2619	14953
238	0010	1119	3436		2626	14940
238	0020	1069	3440		2638	14924
238	0030	0689	3451		2707	14785
238	0050	0497	3460		2738	14712
238	0075	0400	3467		2755	14677
238	0100	0372	3474		2763	14670
238	0150	0356	3479		2769	14672
238	0200	0356	3481		2770	14680
238	0250	0354	3483		2772	14688
238	0300	0357	3483		2772	14698
238	0400	0356	3483		2772	14714
238	0500	0349	3485		2774	14727
238	0600	0351	3492		2779	14746
238	0800	0347	3488		2777	14777
238	1000	0343	3488		2777	14808

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1160	3436		2619	14953	0000	00000	1838
0010	1119	3436		2626	14940	0018	00001	1769
0020	1069	3440		2638	14924	0035	00004	1656
0030	0689	3451		2707	14785	0049	00007	1006
0050	0497	3460		2738	14712	0066	00014	0709
0075	0400	3467		2755	14677	0082	00024	0557
0100	0372	3474		2763	14670	0095	00035	0479
0125	0360	3477		2767	14669	0107	00049	0443
0150	0356	3479		2769	14672	0118	00064	0430
0175	0355	3480		2770	14676	0129	00082	0423
0200	0356	3481		2770	14680	0139	00103	0420
0225	0355	3482		2771	14684	0150	00125	0412
0250	0354	3483		2772	14688	0160	00151	0407
0300	0357	3483		2772	14698	0181	00209	0414
0400	0356	3483		2772	14714	0223	00362	0422
0500	0349	3485		2774	14728	0265	00555	0408
0600	0351	3492		2779	14746	0304	00776	0367
0700	0350	3491		2779	14762	0342	01028	0379
0800	0347	3488		2777	14777	0382	01337	0409
1000	0343	3488		2777	14809	0466	02116	0421

C-REF-NO 004	YR 1962	DEPTH 92	WAVES 1	AIR T	VIS
CONS. NO 014	MONTH 7	MXSAMPD 01	WAVES 2	WET B 10.5	STN 35A
LAT 47-300N	DAY 28	NO.DPTH 7	WND-DIR 250	WW-CODE 50	
LON 50-000W	HR 06.1	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1011.8	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
061	0000	095	3230		2495	14851
061	0010	0952	3230		2495	14853
061	0020	0953	3230		2494	14855
061	0030	0663	3243		2547	14747
061	0050	0106	3263		2616	14516
061	0075	0050	3299		2648	14500
061	0090	0010	3310		2659	14486

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0950	3230		2495	14851	0000	00000	3015
0010	0952	3230		2495	14853	0030	00002	3019
0020	0953	3230		2494	14855	0061	00006	3023
0030	0663	3243		2547	14747	0089	00013	2525
0050	0106	3263		2616	14516	0133	00031	1862
0075	0050	3299		2648	14500	0176	00058	1557

C-REF-NO 004	YR 1962	DEPTH 168	WAVES 1	AIR T	VIS
CONS. NO 015	MONTH 7	MXSAMPD 02	WAVES 2	WET B 09.1	STN 358
LAT 48-000N	DAY 28	NO.DPTH 9	WND-DIR 250	WW-CODE 52	
LON 50-000W	HR 10.5	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1013.2	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
105	0000	084	3192		2482	14805
105	0010	0844	3192		2482	14808
105	0020	0846	3194		2483	14810
105	0030	0182	3252		2602	14546
105	0050	0007	3288		2642	14475
105	0075	-0069	3316		2667	14448
105	0100	-0097	3332		2681	14441
105	0150	0082	3395		2723	14540
105	0165	0164	3422		2740	14583

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0840	3192		2482	14805	0000	00000	3136
0010	0844	3192		2482	14808	0032	00002	3143
0020	0846	3194		2483	14810	0063	00006	3132
0030	0182	3252		2602	14546	0089	00013	1994
0050	0007	3288		2642	14475	0125	00027	1620
0075	-0069	3316		2667	14448	0163	00051	1373
0100	-0097	3332		2681	14441	0196	00080	1239
0125	-0036	3358		2700	14477	0225	00114	1061
0150	0082	3395		2723	14540	0249	00147	0845

C-REF-NO 004	YR 1962	DEPTH 243	WAVES 1	AIR T	VIS
CONS. NO 016	MONTH 7	MXSAMPD 02	WAVES 2	WET B 09.7	STN 35C
LAT 48-250N	DAY 28	NO.DPTH 10	WND-DIR 250	WW-CODE 50	
LON 50-000W	HR 13.8	W-COLOR	WND-FCE 05	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1014.5	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
138	0000	085	3174		2467	14806
138	0010	0848	3180		2472	14808
138	0020	0351	3270		2603	14620
138	0030	0095	3297		2644	14513
138	0050	-0093	3326		2676	14434
138	0075	-0033	3358		2700	14470
138	0100	-0029	3360		2701	14477
138	0150	0125	3404		2728	14561
138	0200	0233	3442		2750	14622
138	0240	0248	3445		2751	14636

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0850	3174		2467	14806	0000	00000	3284
0010	0848	3180		2472	14808	0033	00002	3238
0020	0351	3270		2603	14620	0059	00005	1990
0030	0095	3297		2644	14513	0077	00010	1597
0050	-0093	3326		2676	14434	0106	00022	1289
0075	-0033	3358		2700	14470	0136	00040	1067
0100	-0029	3360		2701	14477	0163	00064	1052
0125	0039	3379		2713	14514	0188	00093	0941
0150	0125	3404		2728	14561	0210	00124	0805
0175	0188	3426		2741	14596	0229	00155	0686
0200	0233	3442		2750	14622	0245	00186	0601
0225	0245	3444		2751	14632	0260	00219	0599



C-REF-NO 004	YR 1962	DEPTH		WAVES 1		AIR T		VIS
CONS. NO 017	MONTH 7	MXSAMPD	05	WAVES 2		WET B	09.4	STN 35E
LAT 49-000N	DAY 28	NO.DPTH	13	WND-DIR	250	WW-CODE	01	
LON 50-000W	HR 19.9	W-COLOR		WND-FCE	05	CLD-TPE		
MARSD SQ 150		W-TRNSP		BARO	1013.2	CLD-AMT	4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
199	0000	079	3315		2586	14801
199	0010	0778	3315		2588	14798
199	0020	0637	3342		2628	14748
199	0030	0319	3411		2718	14627
199	0050	0256	3433		2741	14606
199	0075	0271	3445		2749	14618
199	0100	0277	3456		2758	14627
199	0148	0296	3467		2765	14644
199	0182	0324	3474		2768	14663
199	0230	0327	3476		2769	14672
199	0282	0342	3476		2768	14687
199	0380	0340	3476		2768	14703
199	0491	0346	3483		2773	14724

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0790	3315		2586	14801	0000	00000	2150
0010	0778	3315		2588	14798	0022	00001	2135
0020	0637	3342		2628	14748	0041	00004	1752
0030	0319	3411		2718	14627	0054	00007	0898
0050	0256	3433		2741	14606	0070	00014	0680
0075	0271	3445		2749	14618	0087	00024	0603
0100	0277	3456		2758	14627	0101	00036	0527
0125	0285	3463		2762	14635	0114	00051	0485
0150	0298	3468		2765	14645	0126	00068	0462
0175	0319	3473		2767	14659	0137	00087	0443
0200	0327	3475		2769	14667	0148	00108	0434
0225	0327	3476		2769	14672	0159	00132	0431
0250	0333	3476		2769	14678	0170	00159	0437
0300	0343	3476		2767	14691	0192	00223	0454
0400	0348	3478		2768	14710	0238	00388	0454
0500	0345	3484		2773	14726	0282	00589	0414

C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 018	MONTH 7	MXSAMPD	05	WAVES 2	WET B 09.1	STN 35F
LAT 49-200N	DAY 28	NO.DPTH	13	WND-DIR 250	WW-CODE 01	
LON 50-000W	HR 23.4	W-COLOR		WND-FCE 04	CLD-TPE	
MARSD SQ 150		W-TRNSP		BARO 1013.2	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
234	0000	081	3315		2583	14809
234	0010	0806	3319		2587	14810
234	0020	0808	3322		2589	14812
234	0030	0439	3328		2640	14667
234	0050	0258	3431		2739	14607
234	0075	0289	3454		2755	14627
234	0100	0291	3460		2760	14633
234	0150	0307	3469		2765	14650
234	0200	0319	3478		2771	14664
234	0250	0326	3483		2775	14676
234	0300	0322	3483		2775	14683
234	0400	0338	3487		2777	14707
234	0500	0346	3488		2777	14727

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0810	3315		2583	14809	0000	00000	2178
0010	0806	3319		2587	14810	0022	00001	2144
0020	0808	3322		2589	14812	0043	00004	2126
0030	0439	3328		2640	14667	0062	00009	1637
0050	0258	3431		2739	14607	0086	00018	0696
0075	0289	3454		2755	14627	0101	00028	0551
0100	0291	3460		2760	14633	0115	00040	0509
0125	0298	3465		2763	14641	0127	00054	0481
0150	0307	3469		2765	14650	0139	00071	0459
0175	0314	3474		2768	14657	0150	00089	0431
0200	0319	3478		2771	14664	0161	00110	0406
0225	0324	3481		2773	14671	0171	00132	0390
0250	0326	3483		2775	14676	0181	00155	0379
0300	0322	3483		2775	14683	0200	00209	0380
0400	0338	3487		2777	14707	0238	00346	0374
0500	0346	3488		2777	14727	0276	00523	0383

C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 019	MONTH 7	MXSAMPD	08	WAVES 2	WET B 08.6	STN 050
LAT 50-000N	DAY 29	NO.DPTH	16	WND-DIR 220	WW-CODE 01	
LON 50-000W	HR 08.5	W-COLOR		WND-FCE 05	CLD-TPE	
MARSD SQ 186		W-TRNSP		BARO 1012.5	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
085	0000	071	3284		2573	14766
085	0010	0698	3286		2576	14763
085	0020	0515	3318		2624	14695
085	0030	0349	3418		2721	14641
085	0050	0307	3451		2751	14631
085	0075	0287	3460		2760	14627
085	0100	0321	3472		2766	14648
085	0150	0314	3476		2770	14654
085	0170	0334	3476		2768	14665
085	0205	0339	3478		2769	14674
085	0250	0339	3478		2769	14681
085	0350	0338	3478		2770	14697
085	0430	0341	3479		2770	14712
085	0520	0348	3487		2776	14731
085	0625	0348	3487		2776	14748
085	0850	0352	3487		2775	14787

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0710	3284		2573	14766	0000	00000	2274
0010	0698	3286		2576	14763	0023	00001	2246
0020	0515	3318		2624	14695	0043	00004	1791
0030	0349	3418		2721	14641	0056	00007	0873
0050	0307	3451		2751	14631	0071	00013	0587
0075	0287	3460		2760	14627	0085	00022	0504
0100	0321	3472		2766	14648	0097	00032	0446
0125	0319	3476		2770	14651	0108	00045	0415
0150	0314	3476		2770	14654	0118	00060	0413
0175	0336	3476		2768	14667	0129	00078	0434
0200	0340	3478		2769	14673	0140	00099	0428
0225	0339	3478		2770	14677	0151	00122	0427
0250	0339	3478		2769	14681	0161	00148	0430
0300	0338	3478		2769	14689	0183	00210	0434
0400	0339	3478		2770	14706	0227	00369	0441
0500	0347	3485		2774	14726	0270	00566	0404
0600	0348	3488		2776	14744	0310	00795	0398
0700	0352	3490		2778	14763	0350	01060	0388
0800	0353	3489		2777	14779	0390	01372	0408

C-REF-NO 004	YR 1962	DEPTH 500	WAVES 1	AIR T	VIS
CONS. NO 020	MONTH 7	MXSAMPD 05	WAVES 2	WET B 08.8	STN 49B
LAT 49-540N	DAY 29	NO.OPTH 13	WND-DIR 270	WW-CODE 01	
LON 50-140W	HR 10.2	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1013.8	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
102	0000	073	3284		2570	14774
102	0010	0723	3284		2571	14773
102	0020	0600	3299		2599	14727
102	0030	0026	3364		2702	14491
102	0050	0073	3389		2719	14519
102	0075	0120	3418		2740	14548
102	0100	0176	3423		2740	14578
102	0145	0250	3451		2756	14622
102	0190	0296	3461		2760	14650
102	0240	0327	3467		2762	14673
102	0290	0351	3474		2765	14692
102	0390	0341	3478		2769	14705
102	0490	0338	3481		2772	14721

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0730	3284		2570	14774	0000	00000	2301
0010	0723	3284		2571	14773	0023	00001	2293
0020	0600	3299		2599	14727	0045	00004	2029
0030	0026	3364		2702	14491	0060	00008	1050
0050	0073	3389		2719	14519	0080	00016	0885
0075	0120	3418		2740	14548	0100	00028	0694
0100	0176	3423		2740	14578	0117	00044	0695
0125	0221	3438		2748	14604	0134	00063	0616
0150	0256	3453		2757	14625	0148	00084	0537
0175	0283	3459		2759	14642	0162	00106	0515
0200	0303	3462		2760	14655	0175	00131	0509
0225	0319	3465		2761	14667	0187	00159	0503
0250	0333	3469		2762	14677	0200	00189	0495
0300	0352	3475		2766	14694	0224	00258	0471
0400	0353	3480		2770	14712	0270	00423	0440
0500	0335	3481		2772	14721	0314	00624	0425



C-REF-NO 004 YR 1962 DEPTH 333 WAVES 1 AIR T VIS  
 CONS. NO 021 MONTH 7 MXSAMPD 03 WAVES 2 WET B 09.4 STN 049  
 LAT 49-470N DAY 29 NO.DPTH 12 WND-DIR 270 WW-CODE 02  
 LON 50-300W HR 13.3 W-COLOR WND-FCE 03 CLD-TPE  
 MARSD SQ 150 W-TRNSP BARO 1015.9 CLD-AMT 4 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
133	0000	073	3294		2578	14775
133	0010	0721	3294		2579	14773
133	0020	0380	3328		2646	14640
133	0030	0094	3358		2693	14521
133	0050	0064	3393		2723	14515
133	0075	0117	3409		2732	14546
133	0100	0198	3431		2744	14589
133	0150	0256	3451		2756	14625
133	0200	0293	3459		2759	14650
133	0250	0311	3467		2763	14667
133	0300	0331	3476		2769	14686
133	0330	0332	3478		2770	14691

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0730	3294		2578	14775	0000	00000	2226
0010	0721	3294		2579	14773	0022	00001	2216
0020	0380	3328		2646	14640	0041	00004	1579
0030	0094	3358		2693	14521	0055	00007	1133
0050	0064	3393		2723	14515	0075	00015	0849
0075	0117	3409		2732	14546	0095	00028	0760
0100	0198	3431		2744	14589	0113	00044	0651
0125	0237	3444		2751	14612	0129	00062	0587
0150	0256	3451		2756	14625	0143	00082	0550
0175	0277	3456		2757	14639	0157	00105	0534
0200	0293	3459		2759	14650	0170	00131	0525
0225	0303	3463		2761	14659	0183	00159	0507
0250	0311	3467		2763	14668	0196	00189	0485
0300	0331	3476		2769	14686	0219	00255	0441

C-REF-NO 004	YR 1962	DEPTH 315	WAVES 1	AIR T	VIS
CONS. NO 022	MONTH 7	MXSAMPD 03	WAVES 2	WET B 10.2	STN 48A
LAT 49-420N	DAY 29	NO.DPTH 12	WND-DIR 270	WW-CODE 02	
LON 50-390W	HR 14.3	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1032.8	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
143	0000	078	3290		2568	14794
143	0010	0773	3290		2569	14793
143	0020	0754	3290		2571	14787
143	0030	0306	3346		2667	14613
143	0050	-0005	3371		2709	14481
143	0075	0059	3395		2725	14518
143	0100	0107	3409		2733	14545
143	0148	0213	3442		2752	14605
143	0198	0281	3458		2759	14645
143	0248	0298	3463		2761	14661
143	0298	0306	3472		2768	14674
143	0312	0317	3472		2767	14681

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0780	3290		2568	14794	0000	00000	2323
0010	0773	3290		2569	14793	0023	00001	2315
0020	0754	3290		2571	14787	0047	00005	2290
0030	0306	3346		2667	14613	0065	00009	1377
0050	-0005	3371		2709	14481	0089	00019	0981
0075	0059	3395		2725	14518	0112	00033	0831
0100	0107	3409		2733	14545	0132	00051	0754
0125	0164	3427		2743	14577	0149	00071	0659
0150	0217	3443		2752	14607	0165	00093	0578
0175	0256	3453		2757	14629	0179	00117	0540
0200	0282	3458		2759	14646	0192	00142	0521
0225	0294	3461		2760	14655	0205	00171	0512
0250	0298	3464		2762	14661	0218	00202	0500
0300	0311	3471		2767	14676	0242	00270	0458

C-REF-NO 004	YR 1962	DEPTH 332	WAVES 1	AIR T	VIS
CONS. NO 023	MONTH 7	MXSAMPD 03	WAVES 2	WET B 09.9	STN 048
LAT 49-350N	DAY 29	NO.DPTH 12	WND-DIR 290	WW-CODE 02	
LON 51-000W	HR 17.8	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1019.3	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
178	0000	091	3268		2531	14841
178	0010	0887	3268		2535	14834
178	0020	0824	3290		2561	14814
178	0030	0570	3321		2620	14720
178	0050	0068	3360		2696	14513
178	0075	0069	3393		2723	14522
178	0100	0118	3411		2734	14551
178	0140	0205	3436		2748	14599
178	0190	0266	3449		2753	14636
178	0244	0281	3460		2760	14653
178	0295	0310	3472		2767	14675
178	0328	0307	3472		2768	14679

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0910	3268		2531	14841	0000	00000	2672
0010	0887	3268		2535	14834	0027	00001	2640
0020	0824	3290		2561	14814	0052	00005	2387
0030	0570	3321		2620	14720	0073	00010	1831
0050	0068	3360		2696	14513	0103	00022	1103
0075	0069	3393		2723	14522	0127	00037	0852
0100	0118	3411		2734	14551	0148	00055	0746
0125	0174	3428		2743	14582	0165	00076	0659
0150	0221	3440		2749	14608	0181	00098	0607
0175	0253	3446		2752	14627	0196	00123	0584
0200	0270	3451		2754	14639	0211	00151	0564
0225	0278	3456		2758	14648	0225	00181	0534
0250	0285	3462		2762	14656	0238	00213	0501
0300	0304	3471		2767	14673	0262	00281	0456

C-REF-NO 004	YR 1962	DEPTH 317	WAVES 1	AIR T	VIS
CONS. NO 024	MONTH 7	MXSAMPD 03	WAVES 2	WET B 09.7	STN 047
LAT 49-220N	DAY 29	NO.DPTH 12	WND-DIR CALM	WW-CODE 02	
LON 51-300W	HR 21.2	W-COLOR	WND-FCE 00	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1021.3	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
212	0000	087	3232		2509	14821
212	0010	0777	3232		2523	14787
212	0020	0692	3250		2548	14758
212	0030	0373	3303		2627	14636
212	0050	0246	3337		2665	14589
212	0075	-0005	3362		2702	14484
212	0100	0039	3391		2723	14512
212	0150	0157	3418		2737	14577
212	0200	0227	3440		2749	14619
212	0250	0233				
212	0300	0269				
212	0314	0276	3465		2765	14663

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0870	3232		2509	14821	0000	00000	2881
0010	0777	3232		2523	14787	0028	00001	2752
0020	0692	3250		2548	14758	0055	00005	2508
0030	0373	3303		2627	14636	0076	00011	1761
0050	0246	3337		2665	14589	0108	00023	1397
0075	-0005	3362		2702	14484	0139	00043	1049
0100	0039	3391		2723	14512	0163	00064	0850
0125	0098	3407		2732	14545	0183	00087	0761
0150	0157	3418		2737	14577	0202	00113	0721
0175	0199	3430		2743	14601	0219	00143	0665
0200	0227	3440		2749	14619	0235	00173	0611
0225	0232	3448		2755	14627	0250	00206	0557
0250	0233	3455		2760	14632	0264	00238	0508
0300	0269	3464		2764	14657	0288	00308	0476



C-REF-NO 004	YR 1962	DEPTH 293	WAVES 1	AIR T	VIS
CONS. NO 025	MONTH 7	MXSAMPD 03	WAVES 2	WET B 09.4	STN 046
LAT 49-090N	DAY 30	NO.DPTH 11	WND-DIR 220	WW-CODE 02	
LON 52-000W	HR 00.8	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1015.9	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
008	0000	093	3147		2433	14833
008	0010	0847	3149		2448	14803
008	0020	0443	3261		2587	14658
008	0030	0056	3272		2626	14492
008	0050	-0101	3288		2646	14425
008	0075	-0134	3310		2665	14417
008	0100	-0123	3321		2673	14427
008	0150	-0083	3348		2694	14458
008	0200	-0004	3384		2719	14508
008	0250	0151	3422		2741	14591
008	0291	0269	3456		2758	14655

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0930	3147		2433	14833	0000	00000	3601
0010	0847	3149		2448	14803	0036	00002	3467
0020	0443	3261		2587	14658	0064	00006	2144
0030	0056	3272		2626	14492	0083	00011	1766
0050	-0101	3288		2646	14425	0117	00024	1578
0075	-0134	3310		2665	14417	0155	00048	1397
0100	-0123	3321		2673	14427	0189	00079	1315
0125	-0107	3334		2683	14441	0221	00115	1223
0150	-0083	3348		2694	14458	0250	00157	1120
0175	-0051	3365		2706	14480	0277	00201	1000
0200	-0004	3384		2719	14508	0301	00247	0879
0225	0070	3403		2730	14548	0322	00292	0780
0250	0151	3422		2741	14591	0340	00337	0689

C-REF-NO 004	YR 1962	DEPTH 328	WAVES 1	AIR T	VIS
CONS. NO 026	MONTH 7	MXSAMPD 03	WAVES 2	WET B 08.3	STN 045
LAT 48-550N	DAY 30	NO.DPTH 12	WND-DIR 220	WW-CODE 02	
LON 52-340W	HR 04.5	W-COLOR	WND-FCE 01	CLD-TPE	
MARSD SQ 150		W-TRNSP	BARO 1024.0	CLD-AMT 1	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
045	0000	074	3140		2456	14759
045	0010	0627	3149		2477	14717
045	0020	0588	3149		2482	14703
045	0030	0348	3266		2600	14620
045	0050	-0046	3283		2640	14450
045	0075	-0073	3301		2655	14444
045	0100	-0129	3315		2669	14424
045	0150	-0027	3357		2699	14485
045	0200	0038	3398		2728	14529
045	0250	0192	3431		2745	14611
045	0300	0254	3456		2760	14650
045	0325	0279	3461		2761	14665

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0740	3140		2456	14759	0000	00000	3388
0010	0627	3149		2477	14717	0033	00002	3183
0020	0588	3149		2482	14703	0065	00007	3139
0030	0348	3266		2600	14620	0091	00013	2018
0050	-0046	3283		2640	14450	0128	00028	1635
0075	-0073	3301		2655	14444	0167	00053	1486
0100	-0129	3315		2669	14424	0203	00084	1359
0125	-0094 B	3335		2683	14447	0235	00122	1217
0150	-0027	3357		2699	14485	0264	00162	1075
0175	0002	3378		2714	14506	0289	00204	0928
0200	0038	3398		2728	14529	0311	00246	0796
0225	0115	3416		2738	14570	0330	00287	0712
0250	0192	3431		2745	14611	0347	00329	0653
0300	0254	3456		2760	14650	0377	00412	0519

C-REF-NO 004 YR 1962 DEPTH 102 WAVES 1 AIR T VIS  
 CONS. NO 027 MONTH 7 MXSAMPD 01 WAVES 2 WET B 09.7 STN 044  
 LAT 48-460N DAY 30 NO.DPTH 7 WND-DIR 220 WW-CODE 02  
 LON 52-550W HR 07.2 W-COLOR WND-FCE 01 CLO-TPE  
 MARSD SQ 150 W-TRNSP BARO 1020.9 CLO-AMT 1 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
072	0000	099	3088		2378	14848
072	0010	0981	3091		2382	14846
072	0020	0115	3212		2575	14509
072	0030	-0045	3254		2616	14443
072	0050	-0124	3275		2636	14412
072	0075	-0137	3286		2645	14412
072	0100	-0141	3292		2650	14415

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0990	3088		2378	14848	0000	00000	4130
0010	0981	3091		2382	14846	0041	00002	4095
0020	0115	3212		2575	14509	0073	00007	2256
0030	-0045	3254		2616	14443	0094	00012	1859
0050	-0124	3275		2636	14412	0129	00026	1670
0075	-0137	3286		2645	14412	0170	00052	1581
0100	-0141	3292		2650	14415	0210	00087	1532

C-REF-NO 004	YR 1962	DEPTH	54	WAVES 1 00X0	AIR T	VIS
CONS. NO 028	MONTH 7	MXSAMPD	01	WAVES 2	WET B	STN 043
LAT 48-425N	DAY 30	NO.DPTH	5	WND-DIR CALM	WW-CODE 02	
LON 53-030W	HR 08.5	W-COLOR		WND-FCE 00	CLD-TPE	
MARSD SQ 150		W-TRNSP		BARO 1022.6	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
085	0000	108	3091		2365	14881
085	0010	1057	3093		2371	14874
085	0020	0102	3198		2564	14501
085	0030	-0013	3241		2605	14456
085	0052	-0093	3268		2629	14426

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1080	3091		2365	14881	0000	00000	4250
0010	1057	3093		2371	14874	0042	00002	4200
0020	0102	3198		2564	14501	0075	00007	2355
0030	-0013	3241		2605	14456	0097	00012	1971
0050	-0171 C	3274		2636	14390	0134	00027	1671



C-REF-NO 004	YR 1962	DEPTH 54	WAVES 1	AIR T	VIS
CONS. NO 029	MONTH 8	MXSAMPD 01	WAVES 2	WET B	STN 051
LAT 53-140N	DAY 01	NO.DPTH 5	WND-DIR 180	WW-CODE 47	
LON 55-390W	HR 17.8	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
178	0000	068	2887		2265	14702
178	0010	0636	2889		2272	14686
178	0020	0160	3068		2457	14509
178	0030	-0049	3192		2567	14432
178	0052	-0125	3239		2607	14407

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0680	2887		2265	14702	0000	00000	5208
0010	0636	2889		2272	14686	0052	00003	5143
0020	0160	3068		2457	14509	0095	00009	3379
0030	-0049	3192		2567	14432	0123	00016	2332
0050	-0155	3247		2614	14394	0166	00033	1880

C-REF-NO 004	YR 1962	DEPTH 128	WAVES 1	AIR T	VIS
CONS. NO 030	MONTH 8	MXSAMPD 01	WAVES 2	WET B	STN 052
LAT 53-200N	DAY 01	NO.DPTH 8	WND-DIR 180	WW-CODE 42	
LON 55-300W	HR 19.0	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO 1016.5	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
190	0000	070	2799		2194	14699
190	0010	0378	3068		2440	14603
190	0020	0206	3138		2510	14539
190	0030	-0119	3254		2619	14408
190	0050	-0141	3277		2638	14405
190	0075	-0147	3283		2643	14407
190	0100	-0136	3292		2650	14417
190	0125	-0137	3292		2650	14421

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0700	2799		2194	14699	0000	00000	5892
0010	0378	3068		2440	14603	0047	00002	3538
0020	0206	3138		2510	14539	0080	00007	2876
0030	-0119	3254		2619	14408	0103	00012	1834
0050	-0141	3277		2638	14404	0138	00027	1650
0075	-0147	3283		2643	14407	0179	00053	1601
0100	-0136	3292		2650	14417	0219	00088	1533
0125	-0137	3292		2650	14421	0257	00133	1531

C-REF-NO 004	YR 1962	DEPTH 300	WAVES 1	AIR T	VIS
CONS. NO 031	MONTH 8	MXSAMPD 03	WAVES 2	WET B	STN 053
LAT 53-370N	DAY 01	NO.DPTH 11	WND-DIR 180	WW-CODE 45	
LON 55-000W	HR 22.3	W-COLOR	WND-FCE 02	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO 1015.9	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
223	0000	056	3216		2538	14697
223	0010	0547	3216		2540	14693
223	0020	0476	3239		2566	14669
223	0030	0368	3243		2580	14625
223	0050	-0019	3315		2664	14467
223	0075	-0097	3339		2687	14438
223	0095	-0093	3351		2696	14445
223	0136	-0024	3378		2715	14487
223	0190	0076	3402		2729	14545
223	0240	0146	3418		2738	14587
223	0292	0146	3425		2743	14597

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0560	3216		2538	14697	0000	00000	2603
0010	0547	3216		2540	14693	0026	00001	2590
0020	0476	3239		2566	14669	0051	00005	2343
0030	0368	3243		2580	14625	0074	00011	2209
0050	-0019	3315		2664	14467	0110	00025	1402
0075	-0097	3339		2687	14438	0143	00046	1187
0100	-0087	3354		2699	14449	0171	00071	1071
0125	-0047	3371		2711	14474	0197	00100	0960
0150	0003	3385		2720	14503	0220	00133	0875
0175	0049	3396		2727	14530	0241	00168	0815
0200	0094	3406		2731	14555	0261	00207	0771
0225	0130	3414		2736	14577	0280	00248	0734
0250	0143	3420		2739	14588	0298	00292	0702

C-REF-NO 004	YR 1962	DEPTH 175	WAVES 1	AIR T	VIS
CONS. NO 032	MONTH 8	MXSAMPD 02	WAVES 2	WET B	STN 53A
LAT 53-550N	DAY 02	NO.DPTH 9	WND-DIR 180	WW-CODE 51	
LON 54-300W	HR 02.2	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO 1016.5	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
022	0000	047	3127		2478	14648
022	0010	0487	3124		2474	14656
022	0020	0015	3225		2590	14465
022	0030	0011	3268		2625	14471
022	0050	0011	3301		2652	14479
022	0075	-0088	3330		2679	14441
022	0097	-0100	3348		2694	14442
022	0146	-0042	3369		2709	14480
022	0171	0028	3393		2725	14519

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0470	3127		2478	14648	0000	00000	3178
0010	0487	3124		2474	14656	0032	00002	3218
0020	0015	3225		2590	14465	0059	00005	2106
0030	0011	3268		2625	14471	0078	00010	1775
0050	0011	3301		2652	14479	0112	00024	1523
0075	-0088	3330		2679	14441	0147	00046	1259
0100	-0100	3349		2695	14442	0177	00072	1107
0125	-0080	3360		2703	14457	0203	00103	1034
0150	-0034	3378		2716	14485	0228	00138	0915



C-REF-NO 004	YR 1962	DEPTH 210	WAVES 1	AIR T	VIS
CONS. NO 033	MONTH 8	MXSAMPD 02	WAVES 2	WET B	STN 054
LAT 54-120N	DAY 02	NO.DPTH 10	WND-DIR 180	WW-CODE 51	
LON 54-000W	HR 05.5	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO 1022.6	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
055	0000	049	3081		2439	14650
055	0010	0470	3088		2447	14644
055	0020	-0075	3214		2585	14422
055	0030	-0129	3252		2618	14403
055	0050	-0149	3265		2629	14399
055	0075	-0145	3270		2633	14406
055	0095	-0114	3299		2655	14428
055	0140	-0102	3337		2685	14446
055	0190	-0003	3378		2714	14506
055	0202	0006	3387		2721	14513

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0490	3081		2439	14650	0000	00000	3544
0010	0470	3088		2447	14644	0035	00002	3472
0020	-0075	3214		2585	14422	0064	00006	2155
0030	-0129	3252		2618	14403	0084	00011	1847
0050	-0149	3265		2629	14399	0120	00026	1741
0075	-0145	3270		2633	14406	0163	00053	1701
0100	-0112	3304		2659	14430	0203	00088	1447
0125	-0106	3327		2677	14440	0237	00128	1277
0150	-0082	3346		2692	14458	0268	00171	1139
0175	-0032	3366		2706	14488	0295	00215	1003
0200	0003	3386		2720	14511	0318	00261	0872

C-REF-NO 004	YR 1962	DEPTH 335	WAVES 1	AIR T	VIS
CONS. NO 034	MONTH 8	MXSAMPD 03	WAVES 2	WET B	STN 055
LAT 54-290N	DAY 02	NO.DPTH 12	WND-DIR 180	WW-CODE 51	
LON 53-300W	HR 09.5	W-COLOR	WND-FCE 04	CLD-TPE	
MARSD SQ 186		W-TRNSP	BARO 1017.9	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
095	0000	053	3079		2433	14666
095	0010	0526	3084		2438	14667
095	0020	0529	3348		2646	14705
095	0030	0427	3366		2672	14667
095	0050	0236	3409		2724	14594
095	0075	0233	3431		2741	14600
095	0092	0249	3445		2751	14612
095	0141	0330	3461		2757	14657
095	0190	0357	3474		2764	14678
095	0236	0351	3476		2767	14683
095	0290	0367	3483		2771	14700
095	0325	0365	3485		2772	14705

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0530	3079		2433	14666	0000	00000	3600
0010	0526	3084		2438	14667	0036	00002	3559
0020	0529	3348		2646	14705	0062	00005	1581
0030	0427	3366		2672	14667	0077	00009	1339
0050	0236	3409		2724	14594	0099	00018	0845
0075	0233	3431		2741	14600	0118	00030	0678
0100	0262	3449		2753	14619	0133	00043	0567
0125	0304	3458		2757	14643	0147	00060	0538
0150	0338	3464		2758	14662	0161	00078	0526
0175	0353	3471		2762	14674	0174	00100	0492
0200	0356	3475		2765	14680	0186	00123	0467
0225	0353	3476		2766	14683	0197	00149	0458
0250	0355	3478		2768	14688	0209	00176	0447
0300	0362	3483		2771	14700	0231	00238	0422

C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 035	MONTH 8	MXSAMPD	05	WAVES 2	WET B	STN 55A
LAT 54-370N	DAY 02	NO.DPTH	13	WND-DIR 180	WW-CODE 45	
LON 53-140W	HR 11.8	W-COLOR		WND-FCE 03	CLD-TPE	
MARSD SQ 186		W-TRNSP		BARO 1019.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
118	0000	059	3265		2573	14716
118	0010	0586	3265		2574	14716
118	0020	0492	3391		2684	14696
118	0030	0355	3449		2745	14648
118	0050	0333	3458		2754	14643
118	0075	0299	3461		2760	14633
118	0100	0362	3470		2761	14665
118	0150	0370	3479		2767	14678
118	0200	0366	3483		2771	14685
118	0250	0367	3483		2771	14694
118	0300	0368	3483		2771	14702
118	0400	0378	3483		2770	14723
118	0500	0376	3487		2773	14739

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0590	3265		2573	14716	0000	00000	2270
0010	0586	3265		2574	14716	0023	00001	2266
0020	0492	3391		2684	14696	0040	00004	1218
0030	0355	3449		2745	14648	0050	00006	0645
0050	0333	3458		2754	14643	0062	00011	0558
0075	0299	3461		2760	14633	0075	00019	0507
0100	0362	3470		2761	14665	0088	00031	0499
0125	0377	3476		2764	14676	0100	00045	0474
0150	0370	3479		2767	14678	0112	00061	0444
0175	0368	3482		2769	14682	0123	00079	0425
0200	0366	3483		2771	14685	0133	00100	0414
0225	0366	3483		2771	14689	0144	00123	0415
0250	0367	3483		2771	14694	0154	00148	0420
0300	0368	3483		2771	14702	0176	00209	0425
0400	0378	3483		2770	14723	0220	00367	0445
0500	0376	3487		2773	14739	0263	00570	0422

C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 036	MONTH 8	MXSAMPD	05	WAVES 2	WET B	STN 056
LAT 54-470N	DAY 02	NO.DPTH	13	WND-DIR 180	WW-CODE 45	
LON 53-000W	HR 13.8	W-COLOR		WND-FCE 02	CLD-TPE	
MARSD SQ 186		W-TRNSP		BARO 1019.3	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
138	0000	069	3331		2612	14764
138	0010	0695	3333		2613	14768
138	0020	0481	3443		2727	14698
138	0030	0447	3465		2748	14689
138	0050	0420	3475		2759	14682
138	0075	0404	3485		2768	14681
138	0098	0378	3485		2771	14673
138	0145	0373	3488		2774	14679
138	0193	0373	3488		2774	14687
138	0240	0370	3488		2774	14694
138	0286	0370	3488		2774	14701
138	0385	0370	3488		2774	14718
138	0485	0362	3490		2777	14731

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0690	3331		2612	14764	0000	00000	1898
0010	0695	3333		2613	14768	0019	00001	1891
0020	0481	3443		2727	14698	0033	00003	0816
0030	0447	3465		2748	14689	0040	00005	0616
0050	0420	3475		2759	14682	0051	00009	0515
0075	0404	3485		2768	14681	0063	00017	0426
0100	0377	3485		2771	14673	0074	00026	0400
0125	0371	3487		2773	14675	0083	00037	0385
0150	0373	3488		2774	14680	0093	00051	0379
0175	0373	3488		2774	14684	0103	00067	0380
0200	0373	3488		2774	14688	0112	00086	0384
0225	0371	3488		2774	14692	0122	00107	0384
0250	0370	3488		2774	14695	0132	00130	0385
0300	0370	3488		2774	14704	0151	00186	0391
0400	0368	3489		2775	14720	0191	00329	0394



C-REF-NO 004	YR 1962	DEPTH		WAVES 1	AIR T	VIS
CONS. NO 037	MONTH 8	MXSAMPD 10		WAVES 2	WET B	STN 057
LAT 55-040N	DAY 02	NO.DPTH 16		WND-DIR 160	WW-CODE 43	
LON 52-300W	HR 17.8	W-COLOR		WND-FCE 04	CLD-TPE	
MARSD SQ 186		W-TRNSP		BARD 1017.9	CLD-AMT 9	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
178	0000	083	3418		2661	14830
178	0010	0830	3418		2661	14832
178	0020	0825	3449		2686	14835
178	0030	0526	3465		2739	14721
178	0050	0437	3472		2755	14689
178	0075	0383	3479		2766	14671
178	0100	0353	3483		2772	14663
178	0150	0362	3483		2771	14675
178	0200	0362	3483		2771	14683
178	0250	0351	3487		2775	14687
178	0300	0365	3487		2774	14701
178	0400	0367	3487		2774	14719
178	0500	0367	3487		2774	14735
178	0600	0360	3487		2775	14749
178	0800	0359	3487		2775	14782
178	1000	0351	3488		2776	14812

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0830	3418		2661	14830	0000	00000	1441
0010	0830	3418		2661	14832	0015	00001	1442
0020	0825	3449		2686	14835	0028	00003	1207
0030	0526	3465		2739	14721	0037	00005	0702
0050	0437	3472		2755	14689	0050	00010	0555
0075	0383	3479		2766	14671	0063	00018	0450
0100	0353	3483		2772	14663	0073	00028	0393
0125	0352	3484		2773	14667	0083	00039	0389
0150	0362	3483		2771	14675	0093	00053	0406
0175	0363	3483		2771	14680	0104	00070	0411
0200	0362	3483		2771	14683	0114	00090	0411
0225	0356	3485		2773	14685	0124	00112	0391
0250	0351	3487		2775	14687	0134	00136	0374
0300	0365	3487		2774	14701	0153	00191	0392
0400	0367	3487		2774	14719	0193	00336	0403
0500	0367	3487		2774	14735	0235	00527	0412
0600	0360	3487		2775	14749	0276	00763	0414
0700	0359	3487		2775	14765	0318	01046	0421
0800	0359	3487		2775	14782	0362	01378	0430
1000	0351	3488		2776	14812	0449	02185	0430

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CANADA

DATA RECORD  
**SCOTIAN SHELF**

**No. 4**

**1964 Data Record Series**

**Canadian Oceanographic Data Centre**

Programmed by the  
**Canadian Committee on Oceanography**

**1964**

ROGER DUHAMEL, F. R. S. C.  
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CANADIAN OCEANOGRAPHIC DATA CENTRE

615 Booth Street, Ottawa 4

Data Record

SCOTIAN SHELF

(C.O.D.C. Reference 01-63-002)

No. 4

1964 Data Record Series

Programmed by the Canadian Committee on Oceanography

FISHERIES RESEARCH BOARD OF CANADA  
and  
DALHOUSIE UNIVERSITY

Scotian Shelf

Ship	C. N. A. V. "Sackville"
Local cruise designation:	S-70
Cruise period	March 3 - March 22, 1963
Observers:	D. M. J. Keen Mr. W. Atkinson Mr. R. Doyle Mr. K. Manchester

ATLANTIC OCEANOGRAPHIC GROUP - Dartmouth N.S.  
and  
INSTITUTE OF OCEANOGRAPHY, Dalhousie University, Halifax N.S.

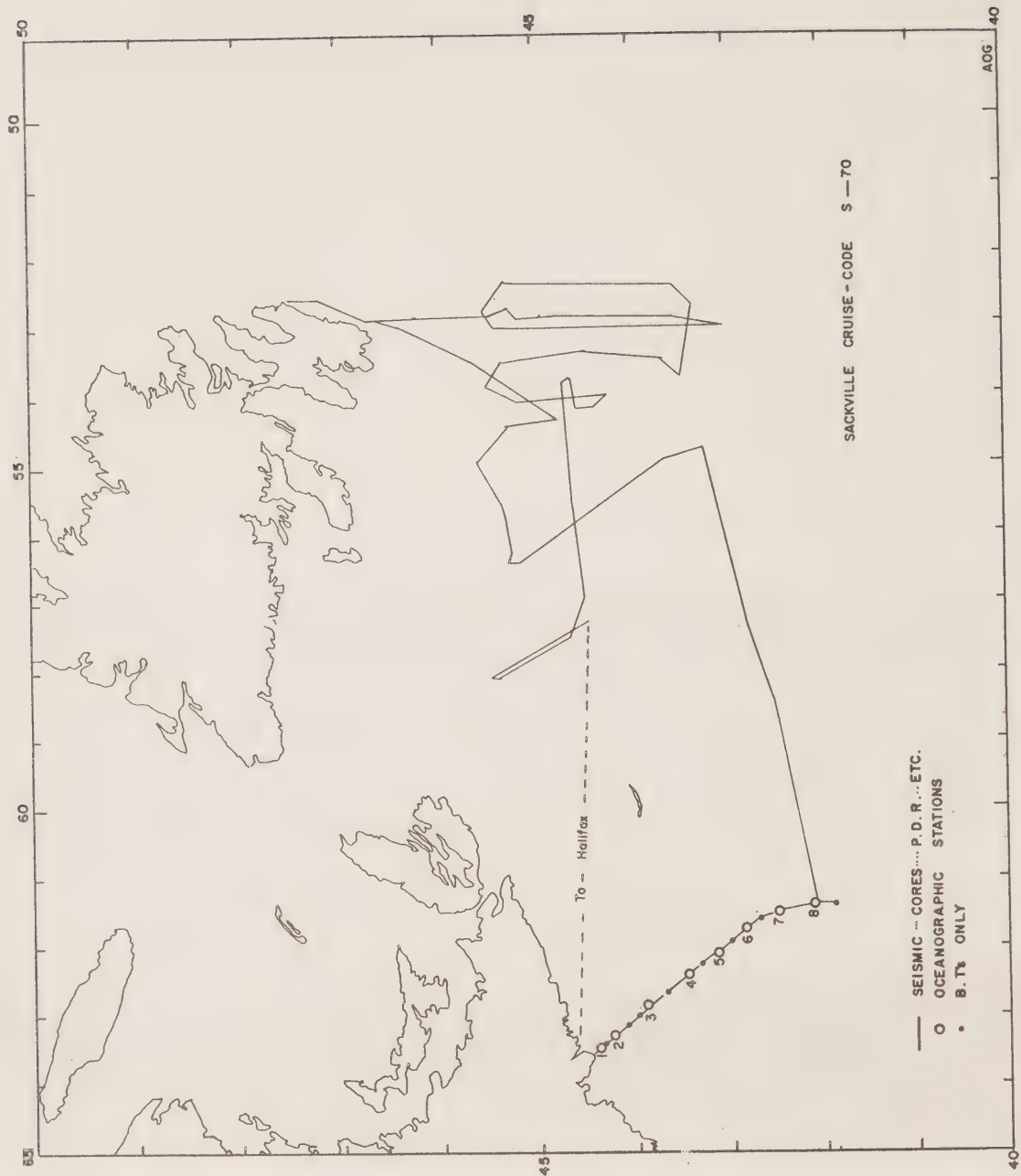
## SECTION I

Description of data collection procedures









# TRACK CHART

## INTRODUCTION

The data in this report were obtained in conjunction with a geophysical program undertaken in the North American Basin of the Atlantic Ocean.

Observations on the cruise also included studies of the heat production in sediments by living organisms, organic matter in sea water, and collection of sediment samples. The main project concentrated on magnetic measurements, echo sounding traverses, and checking of seismic refraction equipment.

The cruise was carried out by personnel of the Institute of Oceanography, Dalhousie University, Halifax, N.S.

The eight stations of the Halifax oceanographic section which is generally occupied seasonally for assessment of Scotian Shelf water conditions, were occupied on this cruise for the Atlantic Oceanographic Group. The locations of the stations are shown on the cruise track chart.

## EXTRACT OF CRUISE LOG

Departed Halifax, N.S.	March 3, 1963
Returned Halifax, N.S.	March 22, 1963

## OBSERVATION PROCEDURES

Eight single cast oceanographic stations were occupied employing Knudsen water bottles and Negretti and Zambra thermometers.

1. Subsurface observations were made at or near standard oceanographic depths.
2. Surface water samples for temperature and salinity were obtained in a metal bucket. The temperature was measured with a chemical thermometer graduated in  $0.5^{\circ}\text{C}$ . intervals and enclosed in a wooden protective casing.
3. Weather observations were made at each oceanographic and bathythermographic station by ships' officers and scientific personnel.

## LABORATORY PROCEDURES

Salinities were analyzed on NIO Conductivity Bridge No. 14, according to the procedure outlined by the National Institute of Oceanography, Wormley, England.

## BATHYTHERMOGRAPH DATA

B. T. observations to a maximum depth of 275 metres were made on station before the serial bottle cast. B. T. stations were run at other intervals as determined by the survey requirements. A surface temperature was obtained with each cast.

Bathythermograph records were processed by the bathythermograph centre of the Bedford Institute of Oceanography, Dartmouth, N. S.

### PERSONNEL

At sea:

M. J. Keen, Scientist-in-Charge - Dalhousie University

W. Atkinson	-	"	"
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R. Doyle	-	"	"
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K. Manchester	-	"	"
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Data Analyses:

Compilation of data:	J. R. Chevrier
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Salinity determinations:	M. E. MacLean
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B. T. Processing:	T. A. Grant
	D. M. MacDonald



## SECTION II

Description of the machine-generated data record



## INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation cycle.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. If interpolations are carried out, additional derived quantities are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct-image masters. These masters subsequently yield the required volume of copies for distribution.

Provision has been made to enter an **"estimate of precision"** for each observed variable selected for interpolation at the standard oceanographic depth. The precision depends on the instrument or technique used to determine the variable.

A standard precision stated as a **standard deviation ( $\sigma$ )** can be determined for each instrument or technique under routine field conditions by making duplicate determinations of the variables for a homogeneous sample of sea water. These standard deviations are given for each cruise under **"GENERAL INFORMATION"** of section II of the data record.

The **measurement error estimate** of a specific observation in this data record, is stated as a multiple of the standard deviation derived as above, and entered in a column immediately to the right of the reported variable. In order to distinguish it from an additional decimal digit, the measurement error estimate is recorded alphabetically, (i.e.,  $1\sigma = A$ ,  $2\sigma = B$ , etc.; in this data record **"A"** is suppressed).

An option is provided with respect to the measurement of the salinity variable. If observed to three decimal digits, the last digit takes the place of the measurement error estimate.

In the past, a number of methods for both manual and machine interpolation have been developed. Studies and comparisons of the several methods have shown that no single method is universally acceptable. The manual methods are the most elaborate and flexible, but often require subjective decisions. In machine interpolation, all the present methods fail to yield acceptable results under some circumstances. Hence, it is considered necessary to qualify interpolated values by stating an **"interpolation error estimate"** derived from the particular interpolation formula used. There are two purposes in stating the error estimates; **first**, to give an indication of the quality of interpolated data; **second**, to allow the oceanographer to redesign his observational procedures in order to reduce interpolation errors in future observations.

The interpolation scheme chosen for the OCEANS II program consists of a combination of two 3-point interpolations using the Lagrangian interpolation polynomial, as recommended by Rattray (1962). A parabola is fitted through three values of a given variable ( $T$ ,  $S$ ,  $O_2$ ) considered as a function of depth. The two interpolation parabolas require a total of four points (observed depths). The middle points are common to both parabolas. The average of the two values obtained from the parabolas at standard depth is taken as the interpolated value, and a function of their difference as an estimate of the interpolation error.

This function combined with the **"measurement error estimate"** comprises the **"combined measurement and interpolation error estimate"**. It is expressed as a multiple of the standard deviation of measurement ( $\sigma$ ) under normal routine field conditions by:

## CANADIAN OCEANOGRAPHIC DATA CENTRE

1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24																																	
IDENT. CODE		LATITUDE (N=+)		LONGITUDE (W=+)		TIME		DATE		TIME		DEPTH		W.W. CODE		TOTAL - P		NO. - N		NO. - M		NO. - S		P.H.		UNASSIGNED		CRUISE REFERENCE NUMBER		CONSEC. NUMBER		VESSEL		ENTERED BY		CHECKED BY		NO. DEPTHS OBS'D.		34 35																																							
COUNTRY		INST.		DEG. MIN.		DEG. MIN.		YEAR MONTH		HOURS G.M.T.		TO BOTTOM		W.W. CODE		TOTAL - P		NO. - N		NO. - M		NO. - S		P.H.		UNASSIGNED		CRUISE REFERENCE NUMBER		CONSEC. NUMBER		VESSEL		ENTERED BY		CHECKED BY		NO. DEPTHS OBS'D.		34 35																																							
1	8																																																																														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61																			



$$\frac{\sigma_i}{\sigma} = \left\{ \frac{(\Delta V_i)^2}{\sigma^2} + \sum_{n=j-2}^{j+1} (\gamma_n)^2 \left( \frac{\sigma_n}{\sigma} \right)^2 \right\}^{1/2}, \text{ where}$$

- $\sigma_i$  = Standard deviation of the combined error estimates at standard oceanographic depth,  
 $\Delta V_i$  = the interpolation error estimate of variable "V" at standard oceanographic depth =  $1/3 (V_{i_1} - V_{i_2})$   
 $\gamma$  = Interpolation polynomial coefficient.  
 $Z_j$  = Observed depth.  
 $Z_i$  = Standard oceanographic depth, such that:  $Z_{j-2} < Z_{j-1} < Z_i < Z_j < Z_{j+1}$

The integral part of the fraction  $\frac{\sigma}{\sigma}$ , if  $\geq 2$ , is reported in this Data Record following the interpolated variable. It represents the **combined measurement and interpolation error estimate**. In order to distinguish it from an additional decimal digit, it is recorded alphabetically (e.g.: 2 as "B", 3 as "C", etc.).

With respect to the interpolated value of the salinity variable if reported to three decimal digits, the **interpolation error estimate** is given only when  $\frac{\sigma}{\sigma} \geq 2$  (the salinity is then recorded to two decimal places). If less than 2, the mean obtained from the two interpolation parabolas is reported to three decimal places.

## EXPLANATION OF DATA RECORD HEADINGS

## MASTER HEADINGS

(1) C-REF-NO	(6) YR	(10) DEPTH	(15) WAVES 1	(20) AIR T	(25) VIS
(2) CONS. NO	(7) MONTH	(11) MXSAMPD	(16) WAVES 2	(21) WET B	(26) STN
(3) LAT	(8) DAY	(12) NO. DPTH	(17) WND-DIR	(22) WW-CODE	
(4) LON	(9) HR	(13) W-COLOR	(18) WND-FCE	(23) CLD-TPE	
(5) MARSD SQ		(14) W-TRNSP	(19) BARO	(24) CLD-AMT	(27) HW

## (1) CRUISE REFERENCE NUMBER:

Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the C.R.N. was a number designated by C.O.D.C.

## (2) CONSECUTIVE NUMBER:

Indicates the chronological order in which the stations were occupied.

## (3) LATITUDE:

Indicate the position of the platform at the time of observation

## (4) LONGITUDE:

## (5) MARSDEN SQUARE: Designates the geographic area code (see Marsden square chart) in which the observation is located.

## (6) YEAR:

## (7) MONTH:

## (8) DAY:

## (9) HOUR:

The time (Greenwich Mean Time) at which the Master-card data were recorded.

It is reported to tenths of hours (Table 1).

If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.

## (10) DEPTH:

The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section II. Charted depths are denoted by the sounding value, preceded by the letter "C".

## (11) MAXIMUM

SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).

00 m - 50 m = 00

51 m - 150 m = 01

151 m - 250 m = 02

etc.

- (12) NUMBER OF DEPTHS: The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch cards).
- (13) WATER COLOUR: A code based on the percentage of yellow (see table 2 and NOTE under FIELD "14" below).
- (14) WATER TRANSPARENCY: The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;
- NOTE: The "GENERAL INFORMATION" chapter in section II of the data record will state which method was used.
- (15) WAVES 1  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (16) WAVES 2  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the predominant other-than wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (17) WIND DIRECTION: The true direction to the nearest 10 degrees from which the wind is blowing. Wind direction 990 means:—wind variable or direction unknown.
- (18) WIND FORCE  
(WND-FCE): Beaufort Notation (See Table 6).
- WIND SPEED  
(WND-SPD): Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section II.
- (19) BAROMETER: The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section II of the data record will state the type of instrument used.
- (20) AIR TEMPERATURE: In degrees Celsius.
- (21) WET BULB: In degrees Celsius.
- (22) ww CODE: Present Weather Code (See Table 7). Ref: WMO Code 4677
- (23) CLOUD TYPE: The type of predominating clouds (See Table 8). Ref: WMO Code 0500.
- (24) CLOUD AMOUNT: The sky coverage in eighths (See Table 9) Ref: WMO Code 2700
- (25) VISIBILITY: Visibility at the surface (See Table 10). Ref: WMO Code 4300.
- (26) STATION: A station reference number, assigned by the institute prior to, or during the survey.
- (27) HOURS AFTER HIGH WATER: Indicates the state of the tide for nearshore observations.

## OBSERVED DATA HEADINGS

(1) GMT	(2) DEPTH	(3) TEMP	(4) SAL	(5) OXYGEN	(6) SGMT
(7) SOUND	(8) PO <sub>4</sub>	(9) -P-	(10) NO <sub>2</sub>	(11) NO <sub>3</sub>	(12) SiO <sub>3</sub>
				(13) pH.	

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

(1) G.M.T.: The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

(2) DEPTH: The depth in metres at the moment the oceanographic bottle reversed.

(3) TEMPERATURE: Temperatures from deepsea reversing thermometers, read to 0.01° C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of this section. An alphabetical character following the Temperature value represents the measurement error estimate referred to in the INTRODUCTION to this section.

(4) SALINITY: Salinity as defined by:  $S = 0.03 + 1.805 C1\%$ , reported in:  
 a. 1/100 parts per 1000, or  
 b. 1/1000 parts per 1000.

In case a: an alphabetical character following the value is the measurement error estimate as referred to under (3)  
 In case b: no error estimate indication is provided for, but an additional decimal digit takes its place.

(5) OXYGEN: The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places.  
 An alphabetical character following the value is the measurement error estimate as referred to under (3).

(6) SIGMA-T: The specific gravity anomaly as defined by:  $(\text{Specific gravity} - 1) \times 10^3$  (e.g.,  $\sigma_t$  reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).

(7) SOUND: The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.



- (8)  $\text{PO}_4$  Phosphate -- Phosphorus reported to hundredths of microgram-atoms per litre.
- (9) -P- Total Phosphorus reported to hundredths of microgram-atoms per litre.
- (10)  $\text{NO}_2$  Nitrite-Nitrogen reported to hundredths of microgram-atoms per litre -- No dissolved nitrogen included --
- (11)  $\text{NO}_3$  Nitrate-Nitrogen reported to tenths of microgram-atoms per litre.
- (12)  $\text{SiO}_3$  Silicate-Silicon reported in whole microgram-atoms per litre.
- (13) pH The pH value.

NOTE: "TRC" (trace) is reported when a chemical entry has a value smaller the standard deviation of measurement for that particular variable.

#### INTERPOLATED DATA HEADINGS

(1) DEPTH	(2) TEMP	(3) SAL	(4) OXYGEN	(5) SGMT	(6) SOUND
(7) DELTA-D	(8) POT-EN	(9) SVA.			

- (1) DEPTH: Standard Oceanographic Depth in whole metres, as well as additional depths: 125, 175, 225, 3500, 4500, 5500, 6500, 7500, 8500, 9500.
- (2) TEMPERATURE: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "INTRODUCTION" to section II of the data record).
- (3) SALINITY: **A.** The reported salinity values are observed to three decimal places.  
     (i) the interpolation error estimate is less than twice the standard deviation of measurement  
         --the interpolated value is reported to three decimal places (e.g., 30.139).  
     (ii) the interpolation error estimate is equal to or greater than twice the standard deviation of measurement.  
         --the interpolated value is reported to two decimal places, and followed by the **interpolation error estimate** (e.g., 29.23C).  
**B.** The reported salinity values are observed to two decimal places and followed by the measurement error estimate.  
     --the interpolated value is reported to two decimal places, and followed by the **combined measurement and interpolation error estimate** (e.g., 30.59B).
- (4) OXYGEN: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "Introduction" to section II of the data record).

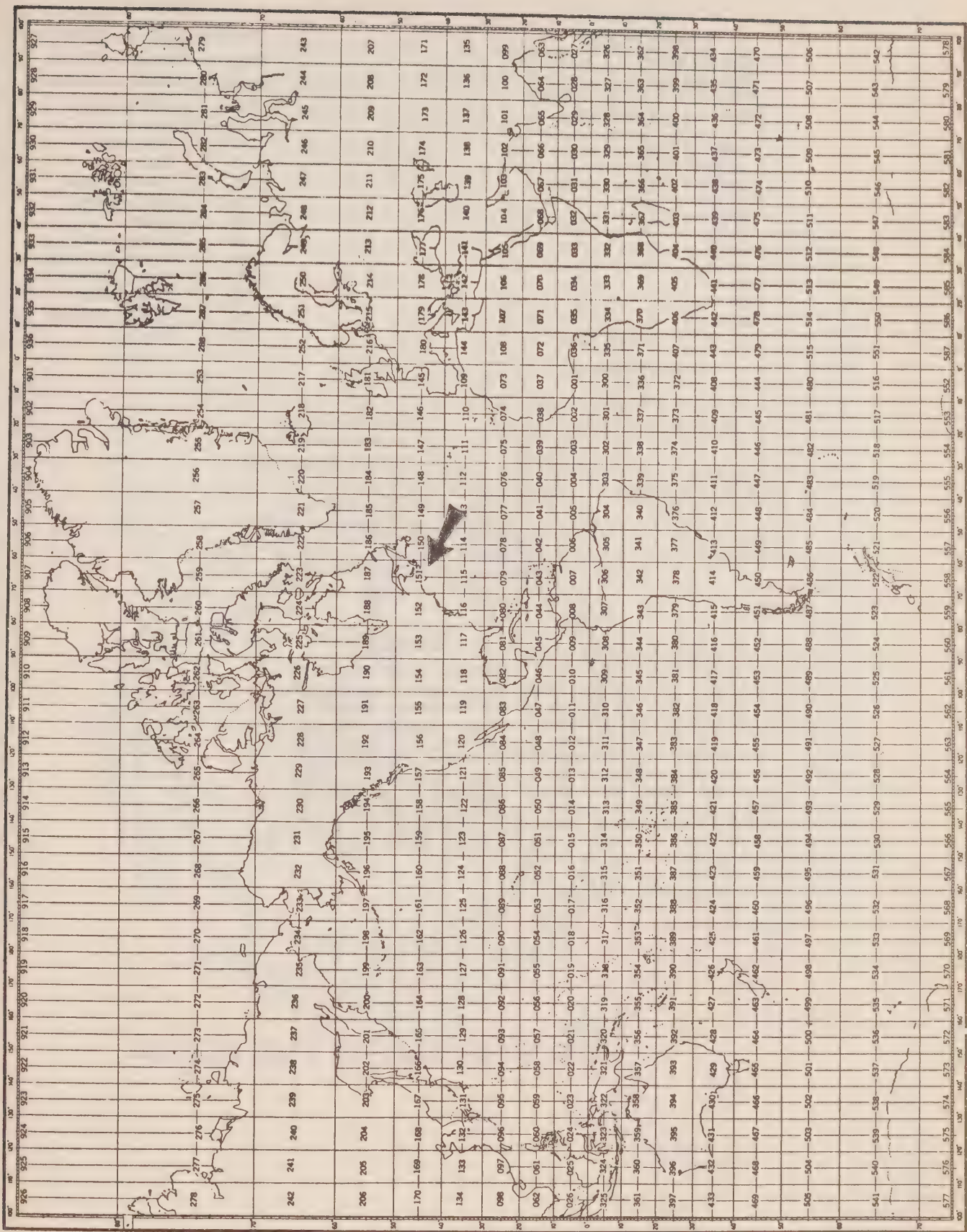
- (5) SIGMA-T: Computed from temperature and salinity values at standard oceanographic depth.
- (6) SOUND VELOCITY: Computed from temperature and salinity values at standard oceanographic depth, using Wilson's formula (1960).
- (7) DELTA-D: The geo-potential anomaly as defined by:
- $$\Delta D = \int_0^p \delta dp$$
- $\Delta D$  is expressed in dynamic metres ( $10^5$  ergs/gram) and recorded to three decimal places (e.g., 2,345 dyn. metres).
- (8) POTENTIAL ENERGY ANOMALY: The Potential energy anomaly  $\chi$  as defined by:
- $$\chi = 1/g \int_0^p \rho \delta dp = \int_0^z \rho p \delta dz$$
- $\chi$  is expressed in units of  $10^8$  ergs/cm<sup>2</sup> and recorded to two decimal places (e.g., 116.44).
- (9) SPECIFIC VOLUME ANOMALY: The specific volume anomaly as defined by:
- $$\delta = \alpha - \alpha_{35.0.P}$$
- $\delta$  is expressed in ml/gr, and conventionally reported as  $10^5 \delta$ , to one decimal place (i.e.,  $\delta$  reported as 1234, reads 123.4, and corresponds to a specific volume anomaly of 0.001234 ml/gr.).

## SPECIAL CHARACTERS

- ‡ (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs
- \* (Asterisk): this character may occur in the **interpolated** portion of the data record. It is printed at the extreme left hand side of the page, when three or more standard depth levels fall within any one **observed depth interval**. The **third**, and all consequent levels within that interval are preceded by the asterisk to indicate that more than **two** machine interpolations were carried out, utilizing the same set of interpolation parabolas.







MARS DEN SQUARE CHART

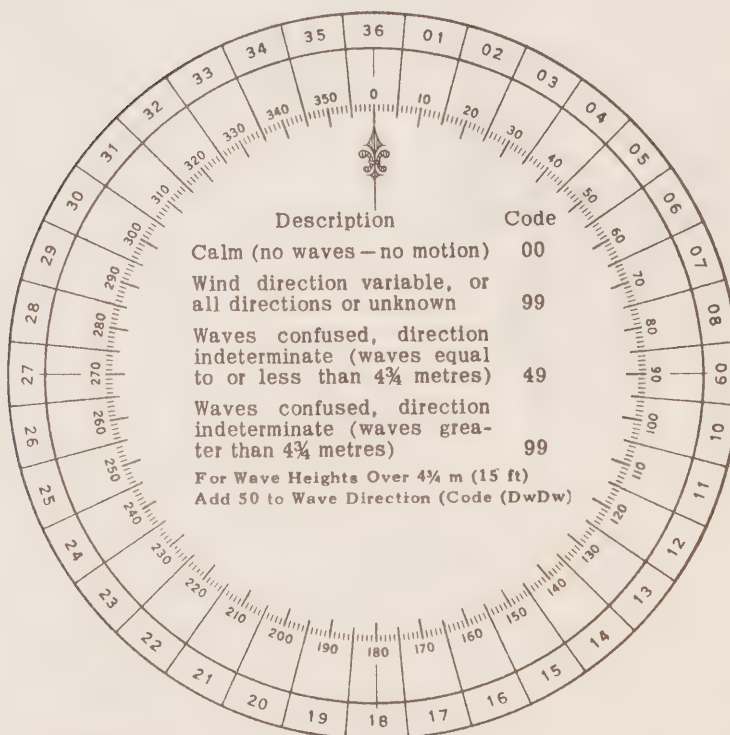
**Table 1**  
**CONVERSION**  
**MINUTES TO  $\frac{1}{10}$  HRS.**

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

**Table 2**  
**WATER COLOR CODE**  
**Based on Percentage Yellow**

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

**Table 3. DIRECTION CODE (dd)**



**NOTE:**

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.

**Table 4. PERIOD OF THE WAVES (Pw)**  
(Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

**Table 5. HEIGHT OF THE WAVES (Hw)**

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 =  $\frac{1}{4}$  m (1 ft) to  $\frac{3}{4}$  m ( $2\frac{1}{2}$  ft); 5 =  $2\frac{1}{4}$  m (7 ft) to  $2\frac{3}{4}$  m (9 ft); 9 =  $4\frac{1}{4}$  m ( $13\frac{1}{2}$  ft) to  $4\frac{3}{4}$  m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of  $2\frac{3}{4}$  m is reported by code figure 5.

Code			Code
0	Less than ¼ m (1 ft)	Add 50 to Dw Dw	0 5 m (16 ft)
1	½ m ( 1½ ft)		1 5½ m (17½ ft)
2	1 m ( 3 ft)		2 6 m (19 ft)
3	1½ m ( 5 ft)		3 6½ m (21 ft)
4	2 m ( 6½ ft)		4 7' m (22½ ft)
5	2½ m ( 8 ft)		5 7½ m (24 ft)
6	3 m ( 9½ ft)		6 8 m (25½ ft)
7	3½ m (11 ft)		7 8½ m (27 ft)
8	4 m (13 ft)		8 9 m (29 ft)
9	4½ m (14 ft)		9 9½ m (30½ ft) or more
x	Height not determined		

Add  
50  
to  
Dw Dw



Table 6. WIND FORCE CODE

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane



Table 7. PRESENT WEATHER

W.W. CODE

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

Code figure ww		
No meteors except photometeors	00	Cloud development not observed or not observable
	01	Clouds generally dissolving or becoming less developed
	02	State of sky on the whole unchanged
Haze, dust, sand or smoke	03	Clouds generally forming or developing
	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes
	05	Haze
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no dustorm or sandstorm
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour
	10	Mist
	11	Patches of
	12	More or less continuous
	13	Lightning visible, no thunder heard
	14	Precipitation within sight, not reaching the ground or the surface of the sea
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station
	17	Thunderstorm, but no precepitation at the time of observation
	18	Squalls
	19	Funnel clouds
		characteristic change of the state of sky during the past hour
ww = 20 - 29		
20		Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation
21		Drizzle (not freezing) or snow grains
22		Rain (not freezing)
23		Snow
24		Rain and snow or ice pellets, type (a)
25		Freezing drizzle or freezing rain
26		Shower(s) of rain
27		Shower(s) of snow, or of rain and snow
28		Shower(s) of hail, or of rain and hail
29		Fog or ice fog
30		Thunderstorm (with or without precipitation)
ww = 30 - 39		
31		Duststorm, sandstorm, drifting or blowing snow
32		Slight or moderate duststorm or sandstorm
33		Severe duststorm or sandstorm
34		Slight or moderate blowing snow
35		Heavy blowing snow
36		Slight or moderate blowing snow
37		Heavy drifting snow
38		Slight or moderate blowing snow
39		Heavy blowing snow
ww = 40 - 49		
40		Fog or ice fog at the time of observation
41		Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer
42		Fog or ice fog in patches
43		Fog or ice fog, sky visible
44		Fog or ice fog, sky invisible
45		Fog or ice fog, sky visible
46		Fog or ice fog, sky invisible
47		Fog or ice fog, sky visible
48		Fog or ice fog, sky invisible
49		Fog, depositing rime, sky visible
		Fog, depositing rime, sky invisible

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

ww = 50 - 59 Drizzle

- |    |  |   |                                      |
|----|--|---|--------------------------------------|
| 50 | Drizzle, not freezing, intermittent          | { | slight at time of observation        |
| 51 | Drizzle, not freezing, continuous            |   |                                      |
| 52 | Drizzle, not freezing, intermittent          | { | moderate at time of observation      |
| 53 | Drizzle, not freezing, continuous            |   |                                      |
| 54 | Drizzle, not freezing, intermittent          | { | heavy (dense) at time of observation |
| 55 | Drizzle, not freezing, continuous            |   |                                      |
| 56 | Drizzle, freezing, slight                    |   |                                      |
| 57 | Drizzle, freezing, moderate or heavy (dense) |   |                                      |
| 58 | Drizzle and rain, slight                     |   |                                      |
| 59 | Drizzle and rain, moderate or heavy          |   |                                      |

ww = 60 - 69 Rain

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 60 | Rain, not freezing, intermittent            | { | slight at time of observation   |
| 61 | Rain, not freezing, continuous              |   |                                 |
| 62 | Rain, not freezing, intermittent            | { | moderate at time of observation |
| 63 | Rain, not freezing, continuous              |   |                                 |
| 64 | Rain, not freezing, intermittent            | { | heavy at time of observation    |
| 65 | Rain, not freezing, continuous              |   |                                 |
| 66 | Rain, freezing, slight                      |   |                                 |
| 67 | Rain, freezing, moderate or heavy           |   |                                 |
| 68 | Rain or drizzle and snow, slight            |   |                                 |
| 69 | Rain or drizzle and snow, moderate or heavy |   |                                 |

70 - 79 Solid precipitation not in showers

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| ww |   |   |                                 |
| 70 | Intermittent fall of snow flakes                      | { | slight at time of observation   |
| 71 | Continuous fall of snow flakes                        |   |                                 |
| 72 | Intermittent fall of snow flakes                      | { | moderate at time of observation |
| 73 | Continuous fall of snow flakes                        |   |                                 |
| 74 | Intermittent fall of snow flakes                      | { | heavy at time of observation    |
| 75 | Continuous fall of snow flakes                        |   |                                 |
| 76 | Ice prisms (with or without fog)                      |   |                                 |
| 77 | Snow grains (with or without fog)                     |   |                                 |
| 78 | Isolated starlike snow crystals (with or without fog) |   |                                 |
| 79 | Ice pellets, type (a)                                 |   |                                 |

ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

- |    |  |   |   |
|----|--|---|---|
| 80 | Rain shower(s), slight   |   |   |
| 81 | Rain shower(s), moderate or heavy  |   |   |
| 82 | Rain shower(s), violent  |   |   |
| 83 | Shower(s) of rain and snow mixed, slight   |   |   |
| 84 | Shower(s) of rain and snow mixed, moderate or heavy  |   |   |
| 85 | Snow shower(s), slight   |   |   |
| 86 | Snow shower(s), moderate or heavy  |   |   |
| 87 | Shower(s) of snow pellets or ice pellets, type (b), with or without rain                         | { | - slight  |
| 88 | or rain and snow mixed   |   |   |
| 89 | Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder      | { | - moderate or heavy   |
| 90 |  |   |   |
| 91 | Slight rain at time of observation   |   |   |
| 92 | Moderate or heavy rain at time of observation  |   |   |
| 93 | Slight snow, or rain and snow mixed or hail at time of observation                               |   | thunderstorm during the preceding hour but not at time of observation |
| 94 | Moderate or heavy snow, or rain and snow mixed or hail at time of observation                    |   |   |
| 95 | Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation | { | thunderstorm at time of observation                                   |
| 96 | Thunderstorm, slight or moderate, with hail at time of observation                               |   |   |
| 97 | Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation              |   |   |
| 98 | Thunderstorm, combined with duststorm or sandstorm at time of observation                        |   |   |
| 99 | Thunderstorm, heavy, with hail at time of observation  |   |   |

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus . . . . . Ci	5	Nimbostratus . . . . . Ns
1	Cirrocumulus . . . . . Cc	6	Stratocumulus . . . . . Sc
2	Cirrostratus . . . . . Cs	7	Stratus . . . . . St
3	Alto cumulus . . . . . Ac	8	Cumulus . . . . . Cu
4	Altostratus . . . . . As	9	Cumulonimbus . . . . . Cb
X	Cloud not visible owing to darkness, fog, duststorm, sandstorm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta =  $\frac{1}{8}$  of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
90	Less than 50 metres (less than 55 yards)
91	50-200 metres (approx. 55-220 yards)
92	200-500 metres (approx. 220-550 yards)
93	500-1,000 metres (approx. 550 yards- $\frac{5}{8}$ n.m.)
94	1-2 km (approx. $\frac{5}{8}$ -1 n.m.)
95	2-4 km (approx. 1-2 n.m.)
96	4-10 km (approx. 2-6 n.m.)
97	10-20 km (approx. 6-12 n.m.)
98	20-50 km (approx. 12-30 n.m.)
99	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile

GENERAL INFORMATION

Institute: Atlantic Oceanographic Group, Dartmouth, N.S.

Observation platform: C.N.A.V. "Sackville"

Vessel's cruising speed: 12 knots

Total number of stations occupied: 8

Air temperature: Was observed from a sling psychrometer

Wet bulb temperature: Was observed from a sling psychrometer

Surface sea water temperature: Was obtained from a metal bucket using a deck thermometer

The following Standard Deviations were used to express both measurement and interpolation error estimates.

Temperature:	0.02
Salinity:	0.003



### SECTION III

Serial oceanographic data



C-REF-NO 002	YR 1963	DEPTH 105	WAVES 1 30X1	AIR T -01.0	VIS
CONS. NO 001	MONTH 3	MXSAMPD 01	WAVES 2 24X2	WET B -04.0	STN
LAT 44-238N	DAY 04	NO.DPTH 7	WND-DIR 300	WW-CODE	
LON 63-280W	HR 11.0	W-COLOR	WND-SPD 07	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
110	0000	0005	31394		2522	14443
110	0010	0004	31493		2530	14448
110	0019	0058	31518		2530	14474
110	0029	0082	31610		2536	14488
110	0048	0080	31617		2536	14490
110	0072	0086 C	31620		2536	14497
110	0096	0072 B	31622		2537	14495

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0005	31394		2522	14443	0000	00000	2755
0010	0004	31493		2530	14448	0027	00001	2680
0020	0062	31527		2530	14476	0054	00006	2680
0030	0083	31613		2536	14489	0081	00012	2624
0050	0081	31617		2536	14491	0134	00034	2619
0075	0080 B	31621		2537	14495	0200	00076	2616

C-REF-NO 002	YR 1963	DEPTH 157	WAVES 1 30X1	AIR T -01.2	VIS
CONS. NO 002	MONTH 3	MXSAMPD 01	WAVES 2 24X2	WET B -03.1	STN
LAT 44-157N	DAY 05	NO.DPTH 8	WND-DIR 300	WW-CODE	
LON 63-192W	HR 00.6	W-COLOR	WND-SPD 07	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
006	0000	-017	31130		2506	14359
006	0010	-0068	31135		2504	14409
006	0020	-0072	31138		2504	14409
006	0030	-0076	31126		2503	14409
006	0050	-0078	31181		2508	14412
006	0075	0158 B	31884		2553	14534
006	0100	0196 B	32158		2572	14558
006	0149	0406	33131		2632	14670

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	-0170	31130		2506	14359	0000	00000	2911
0010	-0068	31135		2504	14409	0029	00002	2929
0020	-0072	31138		2504	14409	0059	00006	2925
0030	-0076	31126		2503	14409	0088	00014	2932
0050	-0078	31181		2508	14412	0147	00038	2887
0075	0158 B	31884		2553	14534	0214	00080	2461
0100	0196 B	32158		2572	14558	0274	00133	2279
0125	0355 I	3276 I		2607	14640	0327	00194	1956
0150	0407	3315 B		2633	14671	0373	00259	1716



C-REF-NO 002	YR 1963	DEPTH 271	WAVES 1 07X0	AIR T	VIS
CONS. NO 003	MONTH 3	MXSAMPD 03	WAVES 2 26X1	WET B	STN
LAT 43-520N	DAY 05	NO.DPTH 11	WND-DIR 070	WW-CODE	
LON 62-530W	HR 06.2	W-COLOR	WND-SPD 01	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
062	0000	010	31798		2550	14494
062	0010	0106	31827		2552	14499
062	0020	0106	31837		2553	14501
062	0030	0124	31876		2555	14511
062	0050	0204	32074		2565	14553
062	0075	0488	33355		2641	14696
062	0100	0592 B	33979		2678	14750
069	0140	0698	34413		2698	14805
069	0190	0691	34555		2710	14812
069	0240	0688	34614		2715	14820
069	0270	0662	34647		2721	14815

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0100	31798		2550	14494	0000	00000	2493
0010	0106	31827		2552	14499	0025	00001	2474
0020	0106	31837		2553	14501	0050	00005	2467
0030	0124	31876		2555	14511	0075	00011	2447
0050	0204	32074		2565	14553	0123	00031	2348
0075	0488	33355		2641	14696	0173	00062	1636
0100	0592 B	33979		2678	14750	0210	00095	1290
0125	0668	3431 E		2694	14789	0240	00130	1144
0150	0703 B	3446 C		2701	14809	0268	00169	1078
0175	0701 C	3454 D		2708	14814	0295	00213	1022
0200	0692	34570		2711	14815	0320	00262	0992
0225	0691	34601		2714	14819	0345	00316	0972
0250	0676 B	3463 B		2718	14817	0369	00375	0931

C-REF-NO 002	YR 1963	DEPTH 82	WAVES 1 05X2	AIR T	VIS
CONS. NO 004	MONTH 3	MXSAMPD 01	WAVES 2 26X2	WET B	STN
LAT 43-295N	DAY 05	NO.DPTH 6	WND-DIR 050	HW-CODE	
LON 62-270W	HR 11.1	W-COLOR	WND-SPD 07	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
108	0000	010 B				
111	0010	0146	31938		2558	14518
111	0020	0144	31939		2558	14519
111	0030	0144	31952		2559	14521
111	0050	0146	31942		2559	14525
111	0075	0388	33048		2627	14650

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0100 B	3193 C		2560	14496	0000	00000	2393
0010	0146	31938		2558	14518	0024	00001	2413
0020	0144	31939		2558	14519	0048	00005	2411
0030	0144	31952		2559	14521	0073	00011	2401
0050	0146	31942		2559	14525	0121	00031	2410
0075	0388	33048		2627	14650	0174	00064	1765

C-REF-NO 002	YR 1963	DEPTH 101	WAVES 1 05X3	AIR T	VIS
CONS. NO 005	MONTH 3	MXSAMPD 01	WAVES 2 26X2	WET B	STN
LAT 43-110N	DAY 05	NO.DPTH 6	WND-DIR 050	HW-CODE	
LON 62-060W	HR 13.7	W-COLOR	WND-SPD 07	CLO-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLO-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
137	0000	025	32403		2588	14569
137	0010	0263	32400		2587	14576
137	0020	0262	32397		2586	14578
137	0030	0264	32424		2588	14580
137	0050	0290 B	32458		2589	14595
137	0075	0457	33092		2623	14679

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0250	32403		2588	14569	0000	00000	2131
0010	0263	32400		2587	14576	0022	00001	2143
0020	0262	32397		2586	14578	0043	00004	2145
0030	0264	32424		2588	14580	0065	00010	2126
0050	0290 B	32458		2589	14595	0107	00027	2122
0075	0457	33092		2623	14679	0157	00059	1800

C-REF-NO 002	YR 1963	DEPTH 878	WAVES 1 05X2	AIR T	VIS
CONS. NO 006	MONTH 3	MXSAMPD 05	WAVES 2 06X3	WET B	STN
LAT 42-510N	DAY 05	NO.DPTH 13	WND-DIR 050	HW-CODE	
LON 61-440W	HR 16.7	W-COLOR	WND-SPD 07	CLO-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLO-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
167	0000	027	32416		2587	14578
167	0010	0282	32421		2587	14585
167	0020	0280	32404		2586	14585
167	0030	0274	32406		2586	14585
167	0050	0278 B	32411		2586	14590
167	0075	0358	32638		2597	14631
167	0100	0608 B	33775		2660	14754
167	0150	0672	34425		2703	14797
171	0200	0679	34633		2718	14810
171	0250	0676	34807		2732	14820
171	0300	0578	34854		2749	14789
171	0400	0522 B	34890		2758	14784
171	0500	0476 B	34916		2766	14782

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0270	32416		2587	14578	0000	00000	2136
0010	0282	32421		2587	14585	0022	00001	2142
0020	0280	32404		2586	14585	0043	00004	2154
0030	0274	32406		2586	14584	0065	00010	2148
0050	0278 B	32411		2586	14590	0108	00028	2148
0075	0358	32638		2597	14631	0161	00061	2046
0100	0608 B	33775		2660	14754	0205	00100	1462
0125	0680 I	3426 I		2689	14793	0238	00138	1193
0150	0672	34425		2703	14797	0267	00178	1065
0175	0680	3456 F		2712	14805	0293	00221	0980
0200	0679	34633		2718	14810	0317	00267	0928
0225	0684 B	3473 B		2725	14818	0339	00317	0866
0250	0676	34807		2732	14820	0360	00368	0802
0300	0578	34854		2749	14789	0397	00470	0647
0400	0522 B	34890		2758	14784	0458	00688	0564
0500	0476 B	34916		2766	14782	0512	00935	0501



C-REF-NO 002	YR 1963	DEPTH 2697	WAVES 1 05X1	AIR T	VIS
CONS. NO 007	MONTH 3	MXSAMPD 05	WAVES 2 06X1	WET B	STN
LAT 42-320N	DAY 05	NO.DPTH 13	WND-DIR 050	WW-CODE	
LON 61-240W	HR 20.6	W-COLOR	WND-SPD 04	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
206	0000	056	33454		2640	14714
206	0010	0565	33470		2641	14718
206	0020	0580	33522		2643	14726
206	0030	0630	33690		2650	14750
206	0050	0651	33746		2652	14763
206	0075	0706 B	33849		2653	14790
206	0100	0854 B	34221		2660	14856
206	0149	1002	34768		2679	14926
206	0199	0948	34994		2705	14917
206	0249	0934	35133		2719	14922
206	0299	0830	35055		2729	14891
206	0398	0620	34945		2750	14824
206	0498	0524 B	34926		2761	14801

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0560	33454		2640	14714	0000	00000	1633
0010	0565	33470		2641	14718	0016	00001	1628
0020	0580	33522		2643	14726	0033	00003	1608
0030	0630	33690		2650	14750	0049	00007	1543
0050	0651	33746		2652	14763	0080	00020	1530
0075	0706 B	33849		2653	14790	0118	00045	1528
0100	0854 B	34221		2660	14856	0156	00079	1464
0125	0954 B	34535		2669	14901	0192	00120	1390
0150	1002	34775		2679	14926	0225	00168	1296
0175	0984 E	3491 D		2693	14926	0257	00219	1172
0200	0948	34998		2706	14918	0285	00273	1054
0225	0944 C	3509 B		2713	14921	0310	00329	0989
0250	0932	35132		2719	14922	0335	00389	0941
0300	0828	35054		2729	14890	0380	00515	0845
0400	0635 F	34949		2749	14830	0456	00785	0665
0500	0522 B	34926		2761	14801	0517	01066	0550

C-REF-NO 002	YR 1963	DEPTH 3968	WAVES 1 05X2	AIR T	VIS
CONS. NO 008	MONTH 3	MXSAMPD 06	WAVES 2 22X4	WET B	STN
LAT 42-025N	DAY 06	NO.DPTH 13	WND-DIR 010	WW-CODE	
LON 61-250W	HR 02.2	W-COLOR	WND-SPD 03	CLD-TPE	
MARSD SQ 151		W-TRNSP	BARO	CLD-AMT	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
022	0000	026	32694		2610	14577
022	0010	0376	32698		2600	14629
022	0030	0377	32693		2600	14633
022	0050	0375	33362		2653	14644
022	0075	0598	34150		2691	14751
022	0100	0848 B	35011		2723	14864
022	0150	1006	35021		2698	14931
022	0200	0944	35045		2710	14917
022	0250	0824	34988		2725	14879
022	0300	0754	34999		2736	14861
022	0400	0616	34946		2751	14822
022	0500	0577 B	34992		2760	14824
022	0600	0488 B	34965		2768	14804

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0260	32694		2610	14577	0000	00000	1918
0010	0376	32698		2600	14629	0020	00001	2013
0020	0396 F	3265 I		2595	14639	0040	00004	2065
0030	0377	32693		2600	14633	0061	00009	2019
0050	0375	33362		2653	14644	0096	00024	1514
0075	0598	34150		2691	14751	0130	00045	1166
0100	0848 B	35011		2723	14864	0156	00067	0869
0125	0969 E	3516 I		2715	14915	0179	00094	0955
0150	1006	35021		2698	14931	0205	00131	1122
0175	0992 C	3504 B		2701	14930	0233	00178	1093
0200	0944	35045		2710	14917	0259	00229	1013
0225	0885 B	3502 B		2718	14898	0284	00282	0945
0250	0824	34988		2725	14879	0307	00338	0879
0300	0754	34999		2736	14861	0349	00456	0777
0400	0616	34946		2751	14822	0421	00710	0642
0500	0577 B	34992		2760	14824	0482	00991	0571
0600	0488 B	34965		2768	14804	0535	01293	0491

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CANADA

DATA RECORD

# OCEAN WEATHER STATION "P"

NORTH PACIFIC OCEAN

**No. 5**

1964 Data Record Series

**Canadian Oceanographic Data Centre**

Programmed by the  
Canadian Committee on Oceanography

1964

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CANADIAN OCEANOGRAPHIC DATA CENTRE

615 Booth Street, Ottawa 4

Data Record

OCEAN WEATHER STATION "P" NORTH PACIFIC OCEAN

(C O D C Reference: 02-63-005)

No. 5

1964 Data Record Series

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FISHERIES RESEARCH BOARD OF CANADA

Ocean Weather Station "P" North Pacific Ocean

Ships:	C.C.G.S. "St. Catharines" C.C.G.S. "Stonetown"
Local Cruise designation:	P - 63 - 4
Cruise period:	September 11 - October 25, 1963
Observers:	Mr. J.A. Strickland Mr. A.R. Stanley-Jones

PACIFIC OCEANOGRAPHIC GROUP - Nanaimo, B.C.



## SECTION I

Description of data collection procedures







Figure 1.

The Canadian Weather Ship C.C.G.S. " St. Catharines ".

( D.O.T. Photo )

The oceanographic winch is located on the starboard side of the signal deck, just aft of the bridge wing.



Figure 2.

The Canadian Weather Ship C.C.G.S. "Stonetown".

( D.O.T. Photo )

Bathythermograph soundings boom can be seen below the bridge on the signal deck.

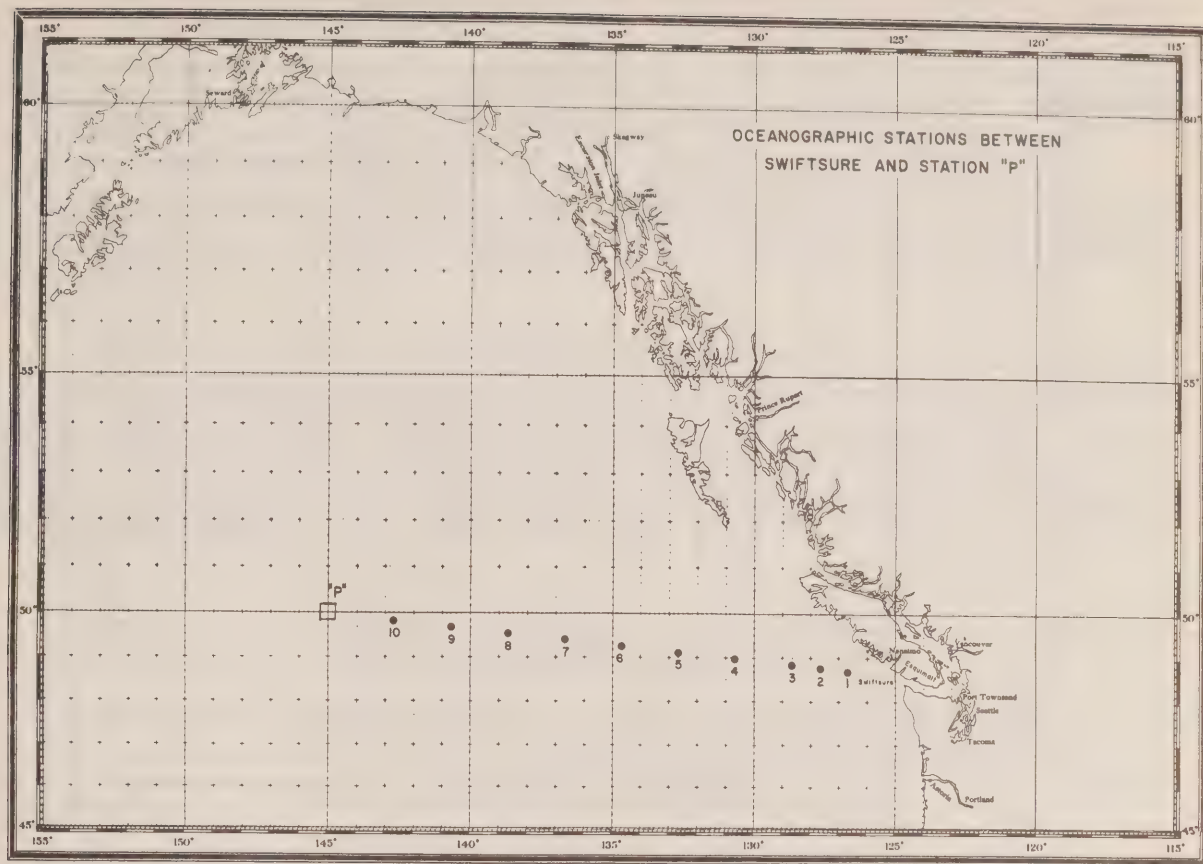


Figure 3. Locations of oceanographic stations observed between Swiftsure Bank and Ocean Weather Station "P".



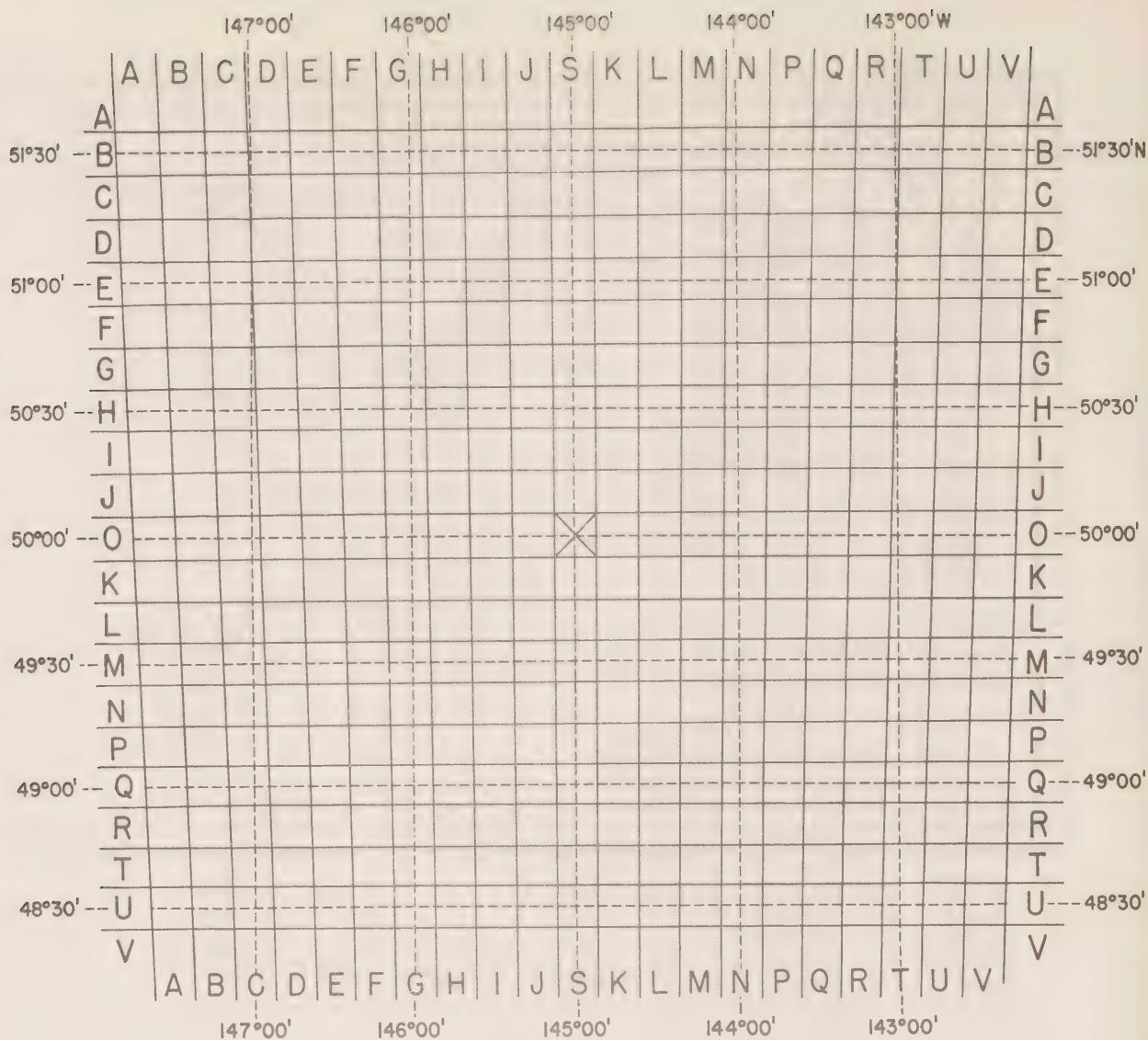


Figure 4.

Position-indicating grid for Ocean Weather Station "P", with mercator projection of a latitude and longitude grid superimposed.



## INTRODUCTION

Canadian operation of Ocean Weather Station "P" (latitude 50°00'N, longitude 145°00'W) was inaugurated in December 1950. The Station is manned by two vessels of the Canadian naval frigate class operated by the Marine Services of the Department of Transport. They are the C.C.G.S. "St. Catharines" and the C.C.G.S. "Stonetown" (Fig. 1 and 2) (Atlantic Oceanographic Group, MS, 1961). Each ship remains on Station for a period of 6 weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch. The chief purpose of the Station is to operate as a meteorological station for surface and upper-air observations, and as an air-sea rescue station.

Twice-daily bathythermograph observations have been made at Station "P" by the Pacific Oceanographic Group since July 1952. A program of more extensive oceanographic observations at Station "P" was commenced in August 1956 on board C.C.G.S. "St. Catharines". This was further extended in April 1959 by the addition of a series of oceanographic stations along the route to and from Station "P" and Swiftsure Bank (Fig. 3).

### EXTRACT OF CRUISE LOG (P.S.T.)

- September 10, 0900: C.C.G.S. "St. Catharines" departed Esquimalt, B.C. for Ocean Weather Station "P". Observed 8 oceanographic stations enroute.
- September 13, 1100: relieved C.C.G.S. "Stonetown", and commenced the normal patrol routine.
- October 2: heavy southwesterly gales forced cancellation of oceanographic work for 2 days.
- October 11: gales to 80 m.p.h. interrupted oceanographic work.
- October 21: heavy weather, with winds gusting to 100 m.p.h., forced cancellation of all oceanographic work for 4 days.
- October 26, 1730: relieved by C.C.G.S. "Stonetown", and proceeded on return trip to base. No stations observed enroute because the relief was delayed 34 hours by rough weather.
- October 29, 0800: Berthed at Esquimalt, B.C.

## OBSERVATION PROCEDURES

The C.C.G.S. "St. Catharines" is equipped with deck and laboratory facilities required to make oceanographic observations. Oceanographers from the Pacific Oceanographic Group accompany the ship on each patrol. The C.C.G.S. "Stonetown" is equipped with a bathythermograph sounding winch. BT observations are made by members of the ship's crew.

### Survey P-63-4, C.C.G.S. "St. Catharines", September 11 to October 25, 1963

Eight oceanographic stations and 12 BT casts (to 275 m) were observed during the journey to Station "P" (September 11-14). Sixteen oceanographic stations were observed at Station "P"; 9 to 400 m depth; 4 to 2000 m; and 3 to 4000 m. A total of 73 BT casts were made to 135 or 275 m depth at Station "P", at 0200 and 1700 G.M.T. daily. Surface salinity samples were collected at the 0200 casts. Four BT casts to 275 m were made during the return trip to the base at Esquimalt, B.C. Dissolved oxygen determinations were made on 281 water samples collected at oceanographic stations.

Vertical plankton hauls from 150 m depth were made at Station "P" in the mornings of 25 days. One plankton haul from 1200 m was made also. Surface horizontal plankton tows were made twice on three consecutive evenings, commencing September 13 and October 9. Surface ocean productivity measurements of photosynthesis ( $C_{14}$  method) and plant pigment concentrations were made on 18 days, and similar measurements were made on samples collected to 50 m depth during 3 days. BT observations to 135 m depth for the OCEAN series (Giovando, MS, 1962) were observed at 2 or 3-day intervals for 12 days.

### Patrol No. 58, C.C.G.S. "Stonetown", October 28 to November 27, 1963

BT casts to 275 m depth were made twice daily at 0200 and 1700 G.M.T. for 28 days on Station "P". Surface salinity samples were collected at the 0200 casts. OCEAN series BT observations to 135 m were made on 16 days during the patrol.

### Oceanographic station procedures

1. Serial observations were made at depths of 10, 20, 30, 50, 75, 100, 125, 150, 175, 200, 250, 300, 400, 500, 750, 1000, 1250, 1500, 2000, 2500 (or 2400), 3000, 3500, 4000, and 4200 metres, depending on the type of station observed and the depth of water. The shallow stations to 400 m were observed in one cast. The intermediate and deep stations were observed in two casts; the first to 400m, and the second from 500 m to the deepest sampling depth.

2. Surface samples (0 metres) for salinity and dissolved oxygen determinations were obtained with a one-gallon bucket. The surface temperature was measured in this bucket sample with an armoured thermometer graduated at 0.5C° intervals.
3. Samples at depth were obtained with Nansen reversing water samplers. From each sampler, the first sample was drawn into a 300 ml B.O.D. bottle for dissolved oxygen analysis. Then, the second sample for salinity analysis was drawn into an 8-oz glass medicine bottle and sealed with a plastic-lined screw cap. These two analyses were done in the shipboard laboratory.
4. Temperatures at depth were measured by deep-sea reversing thermometers of German (Richter & Wiese) or Japanese (Yoshino Keiki Co.) manufacture. All of the samplers were equipped with 2 protected reversing thermometers each, except those at the depth intervals of 20, 50, 100, 150, and 200 m where only one protected thermometer was used. An unprotected thermometer was used on all samplers from 300 m to the deepest in each cast.
5. Water transparency and colour observations were made with a white secchi disc of 30 cm diameter.
6. Station locations were determined by the officers of the watch, who also made the meteorological observations used in the oceanographic records.

### LABORATORY PROCEDURES

#### Methods of analyses

The salinity determinations of the oceanographic station samples collected during Survey P-63-4 were made on an inductive salinometer, Model 601 MK III, manufactured by Auto-Lab Industries Pty. Ltd., Sydney, Australia (Brown and Hamon, 1961). The samples were analysed on board ship, within 2 to 10 days after their collection. The salinity data are the means of duplicate determinations whose "conductivity ratio" values fell within an acceptable range. The accuracy of the determinations at the 35‰ salinity level is stated to be  $\pm 0.003\%$  (Brown and Hamon, 1961). The 0200 surface salinity samples collected during the "Stonetown" Patrol No. 58 were analysed in the shore laboratory using the MK III conductivity salinometer (Strickland, MS. 1958).

The dissolved oxygen analyses were done in the shipboard laboratory by a modified Winkler method (Strickland and Parsons, 1960).



The ocean productivity measurements were made according to the methods described by Strickland (1960). Results will be reported later in a publication of the Fisheries Research Board.

### BATHYTHERMOGRAPH DATA

The BT traces have been drawn on standard pre-printed graphs resembling BT calibration grids of several depth ranges. The slides were positioned on the appropriate calibration grid in an adjustable holder, and displayed in a reflecting-type projector.

All BT traces were aligned using a temperature value obtained from a thermograph recording of the engine-room intake temperature. The top of the trace was always aligned with the zero-depth grid line.

The bathythermograms are arranged in a chronological order in each of three sections for each ship, the first presenting the 135 m casts; the second the 275 m casts; and the third the 135 m casts in the OCEAN series. The date-time and location information are noted below each bathythermogram, using the C.O.D.C. coding system. Those BT observations made at an oceanographic station are identified by an asterisk (\*) preceding the date-time group. Only one of the 8 slides in each day's OCEAN group is reproduced as a bathythermogram. This slide was chosen as being representative of the group. The position co-ordinates are those of the last slide in the group.

### SURFACE SALINITY DATA

These are presented in a table listing the date, position, and salinity values. The data for the C.C.G.S. "St. Catharines" Survey P-63-4 are considered to have an accuracy of  $\pm 0.003\%$  (Brown and Hamon, 1961). The C.C.G.S. "Stonetown" Patrol No. 58 data are from a single determination and have an accuracy range of  $\pm 0.009\%$  at the 95% probability level (Strickland, MS, 1958).

### PERSONNEL

The oceanographers on board C.C.G.S. "St. Catharines" for Survey P-63-4 were Messrs. J.A. Strickland and A.R. Stanley-Jones. The captain was Mr. J.A. Sleight. Members of the crew assisted in the oceanographic work, operating the winch and handling the oceanographic gear. The captain of the C.C.G.S. "Stonetown" during Patrol No. 58 was Mr. J. Linggard. The regular twice-daily BT observations on both ships were made by the crew under the supervision of the officers of the watch, who also made the associated meteorological observations.



The following listed persons assisted in the preparation of the data for presentation to the Canadian Oceanographic Data Centre:

D.G. Robertson:	supervision of Station "P" program , checking data summary sheets, drawing "Stonetown" bathythermograms
H.J. Hollister:	supervision of data summary, preparation of Section I
A.R. Stanley-Jones:	preparation of data summary sheets, drawing "St. Catharines" bathythermo- grams.



## SECTION II

Description of the machine-generated data record





## INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation cycle.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. If interpolations are carried out, additional derived quantities are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct-image masters. These masters subsequently yield the required volume of copies for distribution.

Provision has been made to enter an **"estimate of precision"** for each observed variable selected for interpolation at the standard oceanographic depth. The precision depends on the instrument or technique used to determine the variable.

A standard precision stated as a **standard deviation ( $\sigma$ )** can be determined for each instrument or technique under routine field conditions by making duplicate determinations of the variables for a homogeneous sample of sea water. These standard deviations are given for each cruise under **"GENERAL INFORMATION"** of section II of the data record.

The **measurement error estimate** of a specific observation in this data record, is stated as a multiple of the standard deviation derived as above, and entered in a column immediately to the right of the reported variable. In order to distinguish it from an additional decimal digit, the measurement error estimate is recorded alphabetically, (i.e.,  $1\sigma = A$ ,  $2\sigma = B$ , etc.; in this data record **"A"** is suppressed).

An option is provided with respect to the measurement of the salinity variable. If observed to three decimal digits, the last digit takes the place of the measurement error estimate.

In the past, a number of methods for both manual and machine interpolation have been developed. Studies and comparisons of the several methods have shown that no single method is universally acceptable. The manual methods are the most elaborate and flexible, but often require subjective decisions. In machine interpolation, all the present methods fail to yield acceptable results under some circumstances. Hence, it is considered necessary to qualify interpolated values by stating an **"interpolation error estimate"** derived from the particular interpolation formula used. There are two purposes in stating the error estimates; **first**, to give an indication of the quality of interpolated data; **second**, to allow the oceanographer to redesign his observational procedures in order to reduce interpolation errors in future observations.

The interpolation scheme chosen for the OCEANS II program consists of a combination of two 3-point interpolations using the Lagrangian interpolation polynomial, as recommended by Rattray (1962). A parabola is fitted through three values of a given variable ( $T$ ,  $S$ ,  $O_2$ ) considered as a function of depth. The two interpolation parabolas require a total of four points (observed depths). The middle points are common to both parabolas. The average of the two values obtained from the parabolas at standard depth is taken as the interpolated value, and a function of their difference as an estimate of the interpolation error.

This function combined with the **"measurement error estimate"** comprises the **"combined measurement and interpolation error estimate"**. It is expressed as a multiple of the standard deviation of measurement ( $\sigma$ ) under normal routine field conditions by:

## CANADIAN OCEANOGRAPHIC DATA CENTRE

1 IDENT. CODE		2 LATITUDE (N=+)		3 LONGITUDE (W=+)		5 DATE			6 TIME		7 DEPTH		8 NO. DEPTHS OBS'D.		VESSEL	
COUNTRY	INST.	DEG.	MIN.	DEG.	MIN.	YEAR	MONTH	DAY	HOURS G.M.T.	MIN.	TO BOTTOM			ENTERED BY	CHECKED BY	
1	8															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	34 35	
10	WATER	11 WAVES I	12 WAVES II	13 WIND	14 BAROMETER	15 AIR TEMP.	16 WET BULB	17 W.W. CODE	18 CLOUD	19 HOURS AFTER H.W.	20 UNASSIGNED	21 CRUISE REFERENCE NUMBER	22 CONSEC. NUMBER	23	24	
COLOUR TRANS.	DW	DW	Pw	Hw	DW	DW	Pw	Hw	DIR.	10	10	10	10	10	1	
36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	
68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	
84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	
100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	
132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	
148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	
164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	
180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	
196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	
212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	
228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	
244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	
260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	
292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	
308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	
324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	
340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	
356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	
372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	
388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	
404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	
420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	
436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	
452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	
468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	
484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	
500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	
516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	
532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	
548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	
564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	
580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	
596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	
612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	
628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	
644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	
660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	
692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	
708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	
724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	
740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	
756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	
772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	
788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	
804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	
820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	
836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	
852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	
868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	
884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	
900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	
916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	
932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	
948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	
964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	
980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	
996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	
1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	
1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	
1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	
1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	
1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	
1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	
1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	
1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	
1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	
1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	
1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	
1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	
1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	
1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	
1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	
1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	
1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	
1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	
1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	
1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	
1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	
1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	
1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	
1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	
1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406						

$$\frac{\sigma_i}{\sigma} = \left\{ \frac{(\Delta V_i)^2}{\sigma^2} + \sum_{n=j-2}^{j+1} (\gamma_n)^2 \left( \frac{\sigma_n}{\sigma} \right)^2 \right\}^{1/2}, \text{ where}$$

- $\sigma_i$  = Standard deviation of the combined error estimates at standard oceanographic depth,  
 $\Delta V_i$  = the interpolation error estimate of variable "V" at standard oceanographic depth =  $1/3 (V_{i_1} - V_{i_2})$   
 $\gamma$  = Interpolation polynomial coefficient.  
 $Z_j$  = Observed depth.  
 $Z_i$  = Standard oceanographic depth, such that:  $Z_{j-2} < Z_{j-1} < Z_i < Z_j < Z_{j+1}$

The integral part of the fraction  $\frac{\sigma_i}{\sigma}$ , if  $\geq 2$ , is reported in this Data Record following the interpolated variable. It represents the **combined measurement and interpolation error estimate**. In order to distinguish it from an additional decimal digit, it is recorded alphabetically (e.g.: 2 as "B", 3 as "C", etc.).

With respect to the interpolated value of the salinity variable if reported to three decimal digits, the **interpolation error estimate** is given only when  $\frac{\sigma_i}{\sigma} \geq 2$  (the salinity is then recorded to two decimal places). If less than 2, the mean obtained from the two interpolation parabolas is reported to three decimal places.



## EXPLANATION OF DATA RECORD HEADINGS

## MASTER HEADINGS

(1) C-REF-NO	(6) YR	(10) DEPTH	(15) WAVES 1	(20) AIR T	(25) VIS
(2) CONS. NO	(7) MONTH	(11) MXSAMPD	(16) WAVES 2	(21) WET B	(26) STN
(3) LAT	(8) DAY	(12) NO. DPTH	(17) WND-DIR	(22) WW-CODE	
(4) LON	(9) HR	(13) W-COLOR	(18) WND-FCE	(23) CLD-TPE	
(5) MARSD SQ		(14) W-TRNSP	(19) BARO	(24) CLD-AMT	(27) HW

## (1) CRUISE REFERENCE NUMBER:

Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the C.R.N. was a number designated by C.O.D.C.

## (2) CONSECUTIVE NUMBER:

Indicates the chronological order in which the stations were occupied.

## (3) LATITUDE:

Indicate the position of the platform at the time of observation

## (4) LONGITUDE:

## (5) MARSDEN SQUARE: Designates the geographic area code (see Marsden square chart) in which the observation is located.

## (6) YEAR:

## (7) MONTH:

## (8) DAY:

## (9) HOUR:

The time (Greenwich Mean Time) at which the Master-card data were recorded.

It is reported to tenths of hours (Table 1).

If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.

## (10) DEPTH:

The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section II. Charted depths are denoted by the sounding value, preceded by the letter "C".

## (11) MAXIMUM

SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).

00 m - 50 m = 00

51 m - 150 m = 01

151 m - 250 m = 02

etc.



- (12) NUMBER OF DEPTHS: The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch cards).
- (13) WATER COLOUR: A code based on the percentage of yellow (see table 2 and NOTE under FIELD "14" below).
- (14) WATER TRANSPARENCY: The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;
- NOTE: The "GENERAL INFORMATION" chapter in section II of the data record will state which method was used.
- (15) WAVES 1  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (16) WAVES 2  
( $d_w d_w P_w H_w$ -code): The direction, period and height of the predominant other-than wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Code 3155.
- (17) WIND DIRECTION: The true direction to the nearest 10 degrees from which the wind is blowing. Wind direction 990 means:—wind variable or direction unknown.
- (18) WIND FORCE  
(WND-FCE): Beaufort Notation (See Table 6).
- WIND SPEED  
(WND-SPD): Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section II.
- (19) BAROMETER: The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section II of the data record will state the type of instrument used.
- (20) AIR TEMPERATURE: In degrees Celsius.
- (21) WET BULB: In degrees Celsius.
- (22) ww CODE: Present Weather Code (See Table 7). Ref: WMO Code 4677
- (23) CLOUD TYPE: The type of predominating clouds (See Table 8). Ref: WMO Code 0500.
- (24) CLOUD AMOUNT: The sky coverage in eighths (See Table 9) Ref: WMO Code 2700
- (25) VISIBILITY: Visibility at the surface (See Table 10). Ref: WMO Code 4300.
- (26) STATION: A station reference number, assigned by the institute prior to, or during the survey.
- (27) HOURS AFTER HIGH WATER: Indicates the state of the tide for nearshore observations.

## OBSERVED DATA HEADINGS

(1) GMT	(2) DEPTH	(3) TEMP	(4) SAL	(5) OXYGEN	(6) SGMT
(7) SOUND	(8) $PO_4$	(9) -P-	(10) $NO_2$	(11) $NO_3$	(12) $SiO_3$
				(13) pH.	

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

(1) G.M.T.: The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

(2) DEPTH: The depth in metres at the moment the oceanographic bottle reversed.

(3) TEMPERATURE: Temperatures from deepsea reversing thermometers, read to 0.01° C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of this section. An alphabetical character following the Temperature value represents the measurement error estimate referred to in the INTRODUCTION to this section.

(4) SALINITY: Salinity as defined by:  $S = 0.03 + 1.805 C1\%$ , reported in:  
 a. 1/100 parts per 1000, or  
 b. 1/1000 parts per 1000.

In case a: an alphabetical character following the value is the measurement error estimate as referred to under (3)

In case b: no error estimate indication is provided for, but an additional decimal digit takes its place.

(5) OXYGEN: The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places.

An alphabetical character following the value is the measurement error estimate as referred to under (3). Explanation of "Q" see p. 27.

(6) SIGMA-T: The specific gravity anomaly as defined by:  $(\text{Specific gravity} - 1) \times 10^3$  (e.g.,  $\sigma_t$  reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).

(7) SOUND: The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.

(8) PO <sub>4</sub>	Phosphate – Phosphorus reported to hundredths of microgram-atoms per litre.
(9) -P-	Total Phosphorus reported to hundredths of microgram-atoms per litre.
(10) NO <sub>2</sub>	Nitrite-Nitrogen reported to hundredths of microgram-atoms per litre – No dissolved nitrogen included –
(11) NO <sub>3</sub>	Nitrate-Nitrogen reported to tenths of microgram-atoms per litre.
(12) SiO <sub>2</sub>	Silicate-Silicon reported in whole microgram-atoms per litre.
(13) pH	The pH value.

NOTE: "TRC" (trace) is reported when a chemical entry has a value smaller the standard deviation of measurement for that particular variable.

#### INTERPOLATED DATA HEADINGS

(1) DEPTH	(2) TEMP	(3) SAL	(4) OXYGEN	(5) SGMT	(6) SOUND
(7) DELTA-D	(8) POT-EN	(9) SVA.			

- (1) DEPTH: Standard Oceanographic Depth in whole metres, as well as additional depths: 125, 175, 225, 3500, 4500, 5500, 6500, 7500, 8500, 9500.
- (2) TEMPERATURE: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "INTRODUCTION" to section II of the data record).
- (3) SALINITY: **A.** The reported salinity values are observed to three decimal places.  
 (i) the interpolation error estimate is less than twice the standard deviation of measurement  
 –the interpolated value is reported to three decimal places (e.g., 30.139).  
 (ii) the interpolation error estimate is equal to or greater than twice the standard deviation of measurement.  
 –the interpolated value is reported to two decimal places, and followed by the **interpolation error estimate** (e.g., 29.23C).  
**B.** The reported salinity values are observed to two decimal places and followed by the measurement error estimate.  
 –the interpolated value is reported to two decimal places, and followed by the **combined measurement and interpolation error estimate** (e.g., 30.59B).
- (4) OXYGEN: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "Introduction" to section II of the data record).

- (5) SIGMA-T: Computed from temperature and salinity values at standard oceanographic depth.
- (6) SOUND VELOCITY: Computed from temperature and salinity values at standard oceanographic depth, using Wilson's formula (1960).
- (7) DELTA-D: The geo-potential anomaly as defined by:
- $$\Delta D = \int_0^p \delta dp$$
- $\Delta D$  is expressed in dynamic metres ( $10^5$  ergs/gram) and recorded to three decimal places (e.g., 2,345 dyn. metres).
- (8) POTENTIAL ENERGY ANOMALY: The Potential energy anomaly  $\chi$  as defined by:
- $$\chi = 1/g \int_0^p p \delta dp = \int_0^z \rho p \delta dz$$
- $\chi$  is expressed in units of  $10^8$  ergs/cm<sup>2</sup> and recorded to two decimal places (e.g., 116.44).
- (9) SPECIFIC VOLUME ANOMALY: The specific volume anomaly as defined by:
- $$\delta = \alpha - \alpha_{35.0.P}$$
- $\delta$  is expressed in ml/gr, and conventionally reported as  $10^5 \delta$ , to one decimal place (i.e.,  $\delta$  reported as 1234, reads 123.4, and corresponds to a specific volume anomaly of 0.001234 ml/gr.).

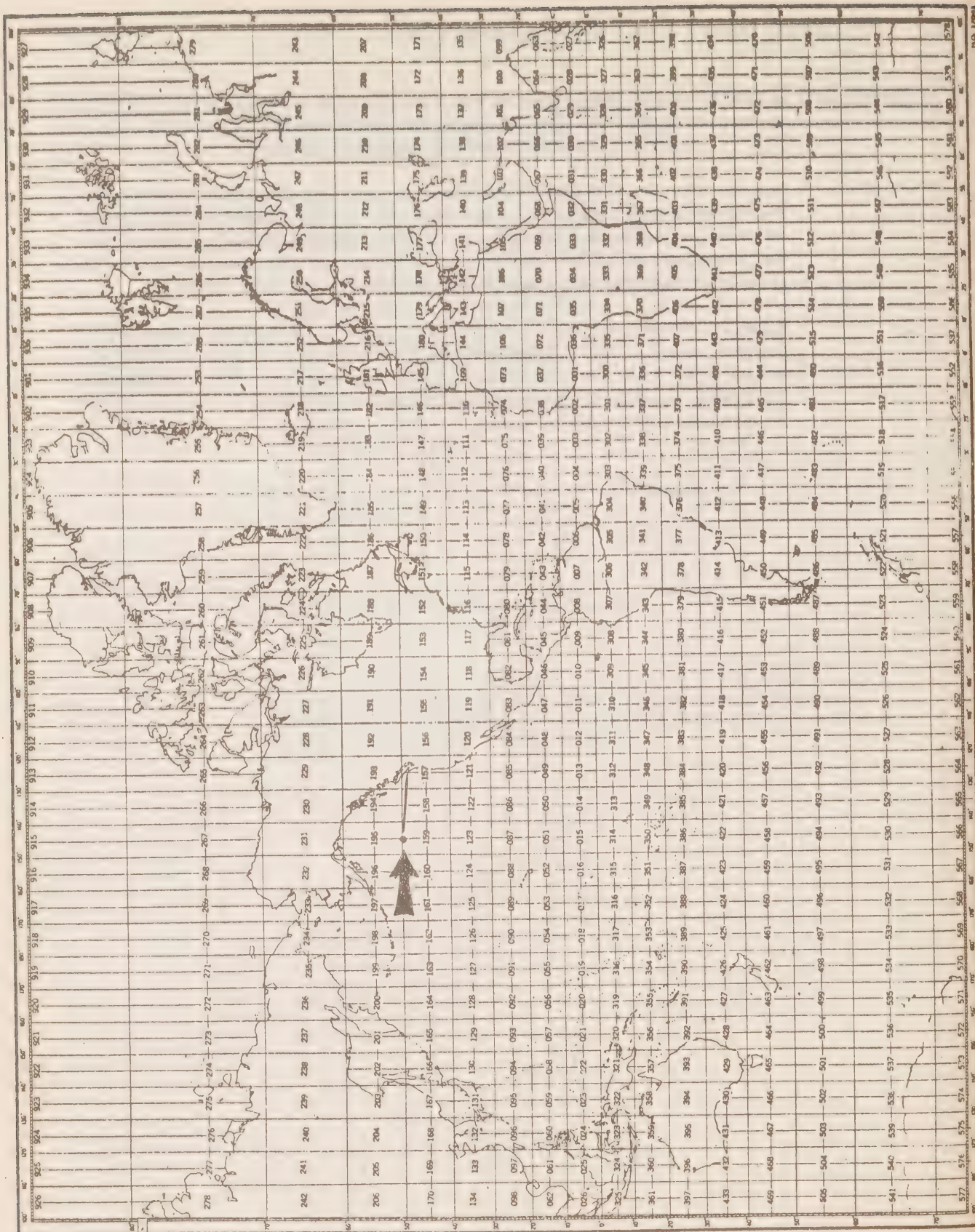


## SPECIAL CHARACTERS

† (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs

\* (Asterisk): this character may occur in the **interpolated** portion of the data record. It is printed at the extreme left hand side of the page, when three or more standard depth levels fall within any one **observed depth interval**. The **third**, and all consequent levels within that interval are preceded by the asterisk to indicate that more than **two** machine interpolations were carried out, utilizing the same set of interpolation parabolas.

Q: appears occasionally in this data record, preceding an observed oxygen value. This "questionable" indicator infers that the value does not fit the usual pattern of oxygen distribution. It could be due to a sampling error and generally not a determination methods error.



MARSDEN SQUARE CHART

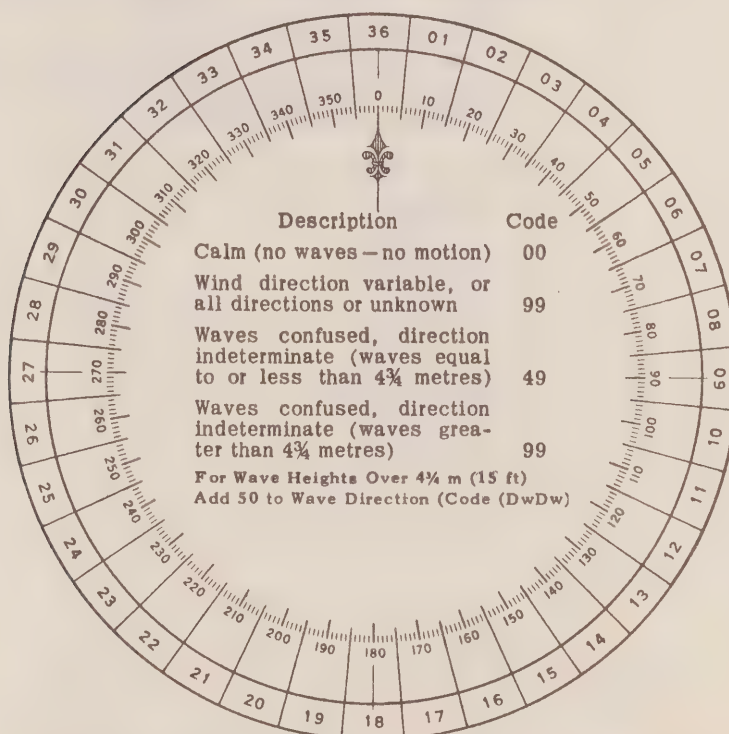
**Table 1**  
**CONVERSION**  
**MINUTES TO  $\frac{1}{4}$  HRS.**

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

**Table 2**  
**WATER COLOR CODE**  
**Based on Percentage Yellow**

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

**Table 3. DIRECTION CODE (dd)**



**NOTE:**

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.



**Table 4. PERIOD OF THE WAVES (P<sub>w</sub>)**  
(Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

**Table 5. HEIGHT OF THE WAVES (H<sub>w</sub>)**

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 =  $\frac{1}{4}$  m (1 ft) to  $\frac{3}{4}$  m ( $2\frac{1}{2}$  ft); 5 =  $2\frac{1}{4}$  m (7 ft) to  $2\frac{3}{4}$  m (9 ft); 9 =  $4\frac{1}{4}$  m ( $13\frac{1}{2}$  ft) to  $4\frac{3}{4}$  m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of  $2\frac{3}{4}$  m is reported by code figure 5.

Code			Code
0	Less than ¼ m (1 ft)	Add 50 to Dw Dw	0 5 m (16 ft)
1	½ m ( 1½ ft)		1 5½ m (17½ ft)
2	1 m ( 3 ft)		2 6 m (19 ft)
3	1½ m ( 5 ft)		3 6½ m (21 ft)
4	2 m ( 6½ ft)		4 7 m (22½ ft)
5	2½ m ( 8 ft)		5 7½ m (24 ft)
6	3 m ( 9½ ft)		6 8 m (25½ ft)
7	3½ m (11 ft)		7 8½ m (27 ft)
8	4 m (13 ft)		8 9 m (29 ft)
9	4½ m (14 ft)		9 9½ m (30½ ft) or more
x	Height not determined		



**Table 6. WIND FORCE CODE**

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane

Table 7. PRESENT WEATHER

W.W. CODE

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

Code figure ww			
No meteors except photometeors	00	Cloud development not observed or not observable	characteristic change of the state of sky during the past hour
	01	Clouds generally dissolving or becoming less developed	
	02	State of sky on the whole unchanged	
	03	Clouds generally forming or developing	
Haze, dust, sand or smoke	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes	
	05	Haze	
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	
	07	Dust or sand raised by wind at or near the station at the time of observation, but no well developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen	
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no dustorm or sandstorm	
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour	
	10	Mist	
	11	Patches of } shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 metres on land or 10 metres at sea	
	12		More of less continuous }
	13	Lightning visible, no thunder heard	
	14	Precipitation within sight, not reaching the ground or the surface of the sea	
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. estimated to be more than 5 km) from the station	
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	
	17	Thunderstorm, but no precepitation at the time of observation	
	18	Squalls	} at or within sight of the station during the preceding hour or at the time of observation
	19	Funnel clouds	
ww = 20 - 29			
		Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation	
	20	Drizzle (not freezing) or snow grains	} not falling as shower(s)
	21	Rain (not freezing)	
	22	Snow	
	23	Rain and snow or ice pellets, type (a)	
	24	Freezing drizzle or freezing rain	
	25	Shower (s) of rain	
	26	Shower (s) of snow, or of rain and snow	
	27	Shower (s) of hail, or of rain and hail	
	28	Fog or ice fog	
	29	Thunderstorm (with or without precipitation)	
ww = 30 - 39			
		Duststorm, sandstorm, drifting or blowing snow	
	30	Slight or moderate dust-storm or sand-storm	- has decreased during the preceding hour
	31		- no appreciable change during the preceding hour
	32		- has begun or has increased during the preceding hour
	33	Severe dust-storm or sand-storm	- has decreased during the preceding hour
	34		- no appreciable change during the preceding hour
	35		- has begun or has increased during the preceding hour
	36	Slight or moderate blowing snow	} generally low (below eye level)
	37	Heavy drifting snow	
	38	Slight or moderate blowing snow	} generally high (above eye level)
	39	Heavy blowing snow	
ww = 40 - 49			
		Fog or ice fog at the time of observation	
	40	Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer	
	41	Fog or ice fog in patches	
	42	Fog or ice fog, sky visible	} has become thinner during the preceding hour
	43	Fog or ice fog, sky invisible	
	44	Fog or ice fog, sky visible	} no appreciable change during the preceding hour
	45	Fog or ice fog, sky invisible	
	46	Fog or ice fog, sky visible	} has begun or has become thicker during the preceding hour
	47	Fog or ice fog, sky invisible	
	48	Fog, depositing rime, sky visible	
	49	Fog, depositing rime, sky invisible	

## NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

## PRECIPITATION ON STATION AT TIME OF OBSERVATION

## ww = 50 - 59 Drizzle

- |    |  |   |                                      |
|----|--|---|--------------------------------------|
| 50 | Drizzle, not freezing, intermittent          | { | slight at time of observation        |
| 51 | Drizzle, not freezing, continuous            |   |                                      |
| 52 | Drizzle, not freezing, intermittent          | { | moderate at time of observation      |
| 53 | Drizzle, not freezing, continuous            |   |                                      |
| 54 | Drizzle, not freezing, intermittent          | { | heavy (dense) at time of observation |
| 55 | Drizzle, not freezing, continuous            |   |                                      |
| 56 | Drizzle, freezing, slight                    |   |                                      |
| 57 | Drizzle, freezing, moderate or heavy (dense) |   |                                      |
| 58 | Drizzle and rain, slight                     |   |                                      |
| 59 | Drizzle and rain, moderate or heavy          |   |                                      |

## ww = 60 - 69 Rain

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| 60 | Rain, not freezing, intermittent            | { | slight at time of observation   |
| 61 | Rain, not freezing, continuous              |   |                                 |
| 62 | Rain, not freezing, intermittent            | { | moderate at time of observation |
| 63 | Rain, not freezing, continuous              |   |                                 |
| 64 | Rain, not freezing, intermittent            | { | heavy at time of observation    |
| 65 | Rain, not freezing, continuous              |   |                                 |
| 66 | Rain, freezing, slight                      |   |                                 |
| 67 | Rain, freezing, moderate or heavy           |   |                                 |
| 68 | Rain or drizzle and snow, slight            |   |                                 |
| 69 | Rain or drizzle and snow, moderate or heavy |   |                                 |

## 70 - 79 Solid precipitation not in showers

- |    |   |   |                                 |
|----|---|---|---------------------------------|
| ww |   |   |                                 |
| 70 | Intermittent fall of snow flakes                      | { | slight at time of observation   |
| 71 | Continuous fall of snow flakes                        |   |                                 |
| 72 | Intermittent fall of snow flakes                      | { | moderate at time of observation |
| 73 | Continuous fall of snow flakes                        |   |                                 |
| 74 | Intermittent fall of snow flakes                      | { | heavy at time of observation    |
| 75 | Continuous fall of snow flakes                        |   |                                 |
| 76 | Ice prisms (with or without fog)                      |   |                                 |
| 77 | Snow grains (with or without fog)                     |   |                                 |
| 78 | Isolated starlike snow crystals (with or without fog) |   |                                 |
| 79 | Ice pellets, type (a)                                 |   |                                 |

## ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

- |    |  |   |   |
|----|--|---|---|
| 80 | Rain shower(s), slight   |   |   |
| 81 | Rain shower(s), moderate or heavy  |   |   |
| 82 | Rain shower(s), violent  |   |   |
| 83 | Shower(s) of rain and snow mixed, slight   |   |   |
| 84 | Shower(s) of rain and snow mixed, moderate or heavy  |   |   |
| 85 | Snow shower(s), slight   |   |   |
| 86 | Snow shower(s), moderate or heavy  |   |   |
| 87 | Shower(s) of snow pellets or ice pellets, type (b), with or without rain                         | { | - slight  |
| 88 | or rain and snow mixed   |   |   |
| 89 | Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder      | { | - moderate or heavy   |
| 90 |  |   |   |
| 91 | Slight rain at time of observation   | { | - slight  |
| 92 | Moderate or heavy rain at time of observation  |   |   |
| 93 | Slight snow, or rain and snow mixed or hail at time of observation                               | { | thunderstorm during the preceding hour but not at time of observation |
| 94 | Moderate or heavy snow, or rain and snow mixed or hail at time of observation                    |   |   |
| 95 | Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation | { | thunderstorm at time of observation                                   |
| 96 | Thunderstorm, slight or moderate, with hail at time of observation                               |   |   |
| 97 | Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation              | { | thunderstorm at time of observation                                   |
| 98 | Thunderstorm, combined with duststorm or sandstorm at time of observation                        |   |   |
| 99 | Thunderstorm, heavy, with hail at time of observation  |   |   |

## PRECIPITATION ON STATION AT TIME OF OBSERVATION



Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus ..... Ci	5	Nimbostratus ..... Ns
1	Cirrocumulus ..... Cc	6	Stratocumulus ..... Sc
2	Cirrostratus ..... Cs	7	Stratus ..... St
3	Alto cumulus ..... Ac	8	Cumulus ..... Cu
4	Altostratus ..... As	9	Cumulonimbus ..... Cb
X	Cloud not visible owing to darkness, fog, duststorm, sandstorm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta =  $\frac{1}{8}$  of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
90	Less than 50 metres (less than 55 yards)
91	50-200 metres (approx. 55-220 yards)
92	200-500 metres (approx. 220-550 yards)
93	500-1,000 metres (approx. 550 yards- $\frac{5}{8}$ n.m.)
94	1-2 km (approx. $\frac{3}{8}$ -1 n.m.)
95	2-4 km (approx. 1-2 n.m.)
96	4-10 km (approx. 2-6 n.m.)
97	10-20 km (approx. 6-12 n.m.)
98	20-50 km (approx. 12-30 n.m.)
99	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile



GENERAL INFORMATION

<u>Institute:</u>	Pacific Oceanographic Group Nanaimo, B.C.
<u>Observation Platforms:</u>	C.C.G.S. "St. Catharines" and C.C.G.S. "Stonetown".
<u>Vessels' Cruising Speed:</u>	12 knots.
<u>Total Number of Stations Occupied:</u>	24
<u>Anemometer Height Above Sea Level:</u>	19 metres.
<u>Water transparency</u>	was obtained using a Secchi Disc.
<u>Barometer readings</u>	were obtained using an Aneroid Barometer and were corrected prior to recording.
<u>Air Temperature</u>	was observed from a Sling Psychrometer.
<u>Wet bulb temperature</u>	was observed from a Sling Psychrometer.
<u>Surface sea water temperature</u>	was obtained from a bucket sample using a deck thermometer.
<u>Depth to bottom</u>	was taken from C. & G.S. Chart 8500.

The following Standard Deviations were used to express both measurement and interpolation error estimates:

Temperature	0.02
Salinity	0.002
Oxygen	0.03



### SECTION III

Serial oceanographic data





C-REF-NO 005 YR 1963 DEPTH C 1591 WAVES 1 12X1 AIR T 17.7 VIS 97  
 CONS. NO 001 MONTH 9 MXSAMPD 12 WAVES 2 0922 WET B 17.7 STN 001  
 LAT 48-42 N DAY 11 NO.DPTH 18 WND-DIR 120 WW-CODE 02  
 LON 126-40 W HR 03.6 W-COLOR WND-SPD 03 CLD-TPE 6  
 MARSD SQ 157 W-TRNSP BAKO 1015.0 CLD-AMT 6 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
036	0000	186 B	31984		2284	15146
036	0010	1823 B	31967		2292	15137
036	0020	1727 B	31958		2314	15110
036	0030	1500	32073		2374	15043
036	0050	0970 B	32396		2499	14868
036	0075	0890	32505		2520	14843
036	0100	0794 B	33043		2577	14818
036	0125	0747 B	33358		2608	14808
036	0150	0739 B	33662		2633	14813
036	0175	0726 C	33809		2647	14814
036	0200	0712 B	33893		2655	14813
036	0250	0648	33926		2666	14797
036	0300	0604 B	33951		2674	14788
036	0400	0551	34062		2689	14784
042	0500	0514 B	34119		2698	14786
042	0750	0416 B	34247		2719	14789
042	1000	0360 B	34337		2732	14808
042	1200	0311	34454		2746	14822

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1860 B	31984		2284	15146	0000	00000	5025
0010	1823 B	31967		2292	15137	0050	00003	4954
0020	1727 B	31958		2314	15110	0099	00010	4744
0030	1500	32073		2374	15043	0144	00021	4175
0050	0970 B	32396		2499	14868	0215	00049	2983
0075	0890	32505		2520	14843	0288	00096	2785
0100	0794 B	33043		2577	14818	0351	00152	2251
0125	0747 B	33358		2608	14808	0404	00212	1956
0150	0739 B	33662		2633	14813	0451	00277	1723
0175	0726 C	33809		2647	14814	0492	00347	1600
0200	0712 B	33893		2655	14813	0532	00422	1522
0225	0682 B	3392 D		2662	14806	0569	00504	1464
0250	0648	33926		2666	14797	0606	00593	1420
0300	0604 B	33951		2674	14788	0676	00789	1351
0400	0551	34062		2689	14784	0805	01251	1215
0500	0514 B	34119		2698	14786	0924	01798	1139
0600	0473 B	34174		2707	14787	1035	02424	1060
0700	0434 B	34224		2716	14788	1138	03113	0987

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0800	0403 B	3426 B		2722	14792	1235	03859	0930
1000	0360 B	34337		2732	14808	1415	05509	0842
1200	0311	34454		2746	14822	1572	07279	0713

C-REF-NO 005	YR 1963	DEPTH C 2600	WAVES 1 14XX	AIR T 18.3	VIS
CONS. NO 002	MONTH 9	MXSAMPD 24	WAVES 2 0922	WET B 17.7	STN 002
LAT 48-47 N	DAY 11	NO.DPTH 21	WND-DIR 140	WW-CODE 03	
LON 127-40 W	HR 08.4	W-COLOR	WND-SPD 02	CLD-TPE 6	
MARSD SQ 157		W-TRNSP	BARO 1015.0	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
084	0000	179 B	31879		2293	15125
084	0010	1740 C	31876		2305	15112
084	0020	1668 B	31954		2328	15092
084	0030	1456	32049		2382	15029
084	0050	0898 B	32421		2513	14841
084	0075	0816	32770		2552	14819
084	0100	0772 B	33303		2600	14813
084	0125	0746 B	33663		2632	14811
084	0150	0728 B	33823		2647	14811
084	0175	0706 C	33897		2656	14807
084	0199	0677 B	33918		2662	14800
084	0249	0638	33969		2671	14793
084	0299	0608	34005		2678	14790
084	0399	0533	34030		2689	14776
091	0493	0481 B	34097		2700	14771
091	0738	0398 B	34298		2725	14780
091	0984	0350 B	34396		2738	14802
091	1234	0291	34433		2746	14819
091	1484	0249	34522		2757	14844
091	1988	0189	34605		2769	14905
091	2393	0178	34640		2772	14970

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1790 B	31879		2293	15125	0000	00000	4939
0010	1740 C	31876		2305	15112	0049	00002	4830
0020	1668 B	31954		2328	15092	0096	00010	4616
0030	1456	32049		2382	15028	0140	00021	4103
0050	0898 B	32421		2513	14841	0210	00048	2855
0075	0816	32770		2552	14819	0277	00090	2481
0100	0772 B	33303		2600	14813	0334	00141	2027
0125	0746 B	33663		2632	14811	0381	00195	1728
0150	0728 B	33823		2647	14811	0423	00253	1588
0175	0706 C	33897		2656	14807	0462	00318	1507
0200	0676 B	33919		2662	14800	0499	00390	1455
0225	0654 B	33945		2667	14795	0535	00468	1411
0250	0637	33970		2671	14793	0571	00554	1373
0300	0607	34005		2678	14790	0638	00745	1315
0400	0532	34031		2689	14776	0766	01201	1216

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0500	0478 B	34103		2701	14771	0883	01741	1108
0600	0438 B	3419 C		2712	14772	0990	02342	1008
0700	0407 B	3427 B		2722	14777	1088	02991	0922
0800	0385 B	34330		2729	14785	1178	03684	0859
1000	0346 B	34399		2738	14803	1344	05212	0780
1200	C299	34428		2745	14817	1495	06923	0718
1500	0246	34526		2758	14846	1696	09691	0603
2000	0191	3462 D		2769	14908	1974	14640	0492



C-REF-NO 005	YR 1963	DEPTH		WAVES 1 13X1	AIR T 18.3	VIS
CONS. NO 003	MONTH 9	MXSAMPD 24		WAVES 2 0922	WET B 17.7	STN 003
LAT 48-52 N	DAY 11	NO.DPTH 21		WND-DIR 130	WW-CODE 02	
LON 128-40 W	HR 13.1	W-COLOR		WND-SPD 03	CLD-TPE 6	
MARSD SQ 157		W-TRNSP		BARO 1013.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
131	0000	173 B	31980		2315	15108
131	0010	1721	31979		2317	15107
131	0020	1374 B	32031		2397	15000
131	0030	1011	32332		2487	14879
131	0050	0903 B	32471		2516	14844
131	0075	0790	32835		2561	14809
131	0099	0728 B	33312		2607	14796
131	0124	0723 B	33614		2632	14802
131	0149	0714 B	33812		2649	14805
131	0174	0592 B	33873		2669	14761
131	0199	0684 B	33919		2661	14803
131	0248	0630	33943		2670	14790
131	0298	0596	33996		2679	14785
131	0397	0548	34064		2690	14783
137	0495	0502 C	34133		2701	14781
137	0743	0417	34284		2722	14789
137	0995	0347	34400		2738	14803
137	1249	0289	34472		2750	14821
137	1500	0243	34524		2758	14845
137	2000	0194	34596		2767	14909
137	2400	0179	34633		2772	14971

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1730 B	31980		2315	15108	0000	00000	4729
0010	1721	31979		2317	15107	0047	00002	4712
0020	1374 B	32031		2397	15000	0091	00009	3952
0030	1011	32332		2487	14879	0126	00018	3092
0050	0903 B	32471		2516	14844	0186	00042	2825
0075	0790	32835		2561	14809	0251	00083	2396
0100	0727 B	33327		2609	14796	0306	00132	1948
0125	0724 B	33624		2632	14802	0352	00185	1726
0150	0708 B	33816		2650	14803	0394	00243	1567
0175	0594 B	33875		2669	14762	0431	00304	1380
0200	0684 B	33920		2661	14803	0467	00373	1465
0225	0673 C	3394 C		2664	14803	0504	00453	1442
0250	0628	33945		2671	14789	0539	00540	1380
0300	0595	33998		2679	14785	0607	00731	1305
0400	0547	34066		2690	14782	0734	01184	1207

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0500	0500 C	34136		2701	14781	0850	01722	1109
0600	0462 C	34201		2711	14783	0958	02329	1027
0700	0430	34260		2719	14786	1058	02996	0954
0800	0400	34314		2726	14791	1152	03713	0889
1000	0346	34402		2739	14803	1320	05263	0777
1200	0299	34461		2748	14817	1469	06942	0694
1500	0243	34524		2758	14845	1666	09660	0600
2000	0194	34596		2767	14909	1949	14703	0512

C-REF-NO 005 YR 1963 DEPTH C 3438 WAVES 1 12X3 AIR T 18.8 VIS  
 CONS. NO 004 MONTH 9 MXSAMPD 15 WAVES 2 15X2 WET B 17.7 STN 004  
 LAT 49-00 N DAY 11 NO.DPTH 19 WND-DIR 120 WW-CODE 02  
 LON 130-40 W HR 21.0 W-COLOR WND-SPD 05 CLD-TPE 8  
 MARSD SQ 158 W-TRNSP 19 BARO 1014.0 CLD-AMT 3 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
210	0000	184 B	32144		2301	15143
210	0009	1786	32142		2314	15128
210	0019	1760 B	32146		2321	15122
210	0028	1690	32214		2342	15104
210	0047	1108 B	32447		2480	14918
210	0070	0885 B	32514		2522	14841
210	0094	0815 B	32634		2542	14820
210	0117	0720 C	33070		2589	14792
210	0141	0670 B	33377		2620	14780
210	0165	0664 B	33650		2643	14786
210	0188	0655 B	33820		2657	14788
210	0235	0634	33893		2666	14788
210	0283	0577	33916		2675	14774
210	0379	0484	33950		2688	14752
216	0493	0440 B				
216	0741	0374	34254		2724	14770
216	0992	0332 B	34380		2738	14796
216	1244	0280	34473		2750	14817
216	1496	0242	34520		2757	14843

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1840 B	32144		2301	15143	0000	00000	4862
0010	1784	32141		2315	15128	0048	00002	4737
0020	1757 B	32151		2322	15121	0095	00010	4670
0030	1634 H	3224 B		2357	15087	0141	00021	4336
0050	1060 D	3246 C		2489	14901	0215	00050	3079
0075	0865 C	3252 D		2526	14834	0288	00097	2735
0100	0789 B	3274 G		2554	14812	0354	00155	2470
0125	0698 B	3318 B		2601	14786	0410	00219	2021
0150	0665 B	33487		2630	14781	0458	00286	1755
0175	0660 B	33735		2650	14787	0500	00355	1568
0200	0651 B	3386 E		2661	14789	0538	00429	1467
0225	0640	3390 E		2665	14789	0574	00508	1429
0250	0618	33903		2669	14784	0610	00595	1398
0300	0558	33922		2678	14769	0678	00788	1316
0400	0473	3397 B		2691	14751	0805	01239	1194
0500	0438 B	3404 H		2701	14754	0921	01774	1105
0600	0408 B	3413 H		2711	14759	1028	02378	1018

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0700	0383	3422 D		2720	14766	1127	03034	0933
0800	0363	34288		2728	14776	1218	03734	0866
1000	0330 B	34384		2739	14796	1384	05261	0773
1200	0289	34460		2749	14813	1531	06922	0683
1500	0241	34520		2758	14844	1727	09620	0601



C-REF-NO 005 YR 1963 DEPTH C 3328 WAVES 1 1221 AIR T 17.7 VIS 96  
 CONS. NO 005 MONTH 9 MXSAMPD 15 WAVES 2 1735 WET B 16.6 STN 005  
 LAT 49-10 N DAY 12 NO.DPTH 19 WND-DIR 120 WW-CODE 50  
 LON 132-40 W HR 04.8 W-COLOR WND-SPD 06 CLD-TPE 7  
 MARSD SQ 158 W-TRNSP BARO 1012.0 CLD-AMT 8 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
048	0000	175 B	32436		2345	15120
048	0010	1718	32433		2353	15112
048	0020	1608 B	32437		2378	15080
048	0030	1175 B	32488		2471	14939
048	0050	0867 B	32512		2524	14831
048	0075	0794	32524		2536	14807
048	0100	0741 B	32618		2551	14792
048	0125	0689 B	32969		2586	14780
048	0150	0638 B	33360		2623	14769
048	0175	0641 B	33594		2641	14777
048	0200	0644 B	33776		2655	14785
048	0250	0611	33892		2669	14782
048	0300	0518	33902		2681	14752
048	0400	0438	33981		2696	14737
054	0490	0415	34079		2706	14743
054	0736	0369	34266		2726	14767
054	0983	0320	34378		2739	14789
054	1233	0272	34452		2749	14811
054	1483	0239	34520		2758	14840

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1750 B	32436		2345	15120	0000	00000	4441
0010	1718	32433		2353	15112	0044	00002	4374
0020	1608 B	32437		2378	15080	0087	00009	4133
0030	1175 B	32488		2471	14939	0124	00018	3251
0050	0867 B	32512		2524	14831	0184	00042	2742
0075	0794	32524		2536	14807	0252	00085	2633
0100	0741 B	32618		2551	14792	0316	00143	2495
0125	0689 B	32969		2586	14780	0375	00210	2168
0150	0638 B	33360		2623	14769	0425	00280	1815
0175	0641 B	33594		2641	14777	0469	00353	1648
0200	0644 B	33776		2655	14785	0509	00429	1519
0225	0635 B	3386 E		2663	14786	0546	00511	1447
0250	0611	33892		2669	14782	0582	00598	1398
0300	0518	33902		2681	14752	0650	00788	1283
0400	0438	33981		2696	14737	0772	01224	1144
0500	0413	34088		2707	14744	0883	01733	1045
0600	0393	34175		2716	14753	0984	02305	0967

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0700	0375	34245		2723	14763	1079	02935	0904
0800	0356	34301		2730	14773	1167	03617	0849
1000	0316	34384		2740	14790	1330	05113	0758
1200	0278	34444		2748	14808	1476	06758	0683
1500	0237	34523		2758	14842	1670	09438	0594

C-REF-NO 005	YR 1963	DEPTH C 2798	WAVES 1 17X3	AIR T 17.7	VIS 97
CONS. NO 006	MONTH 9	MXSAMPD 14	WAVES 2 17X4	WET B 17.7	STN 006
LAT 49-19 N	DAY 12	NO.DPTH 19	WND-DIR 170	WW-CODE 50	
LON 134-40 W	HR 12.6	W-COLOR	WND-SPD 06	CLD-TPE 6	
MARSD SQ 158		W-TRNSP	BARO 1007.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
126	0000	173 B	32335		2342	15112
126	0010	1711	32345		2348	15109
126	0020	1711 B	32356		2348	15110
126	0030	1418 C	32445		2420	15021
126	0049	0956 B	32458		2506	14863
126	0074	0796	32512		2535	14807
126	0098	0698 B	32753		2568	14776
126	0123	0624 C	33224		2614	14757
126	0148	0618 B	33580		2643	14764
126	0173	0629 B	33725		2653	14774
126	0197	0612 B	33821		2663	14772
126	0247	0569	33890		2674	14764
126	0295	0514	33902		2681	14750
126	0393	0471	34011		2695	14750
132	0441	0453 B	34060		2700	14751
132	0681	0387	34245		2722	14765
132	0932	0322 B	34349		2737	14781
132	1190	0276	34431		2747	14805
132	1440	0242	34503		2756	14834

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1730 B	32335		2342	15112	0000	00000	4470
0010	1711	32345		2348	15108	0045	00002	4423
0020	1711 B	32356		2348	15110	0089	00009	4418
0030	1418 C	32445		2420	15021	0130	00019	3737
0050	0944 B	32458		2508	14859	0197	00046	2897
0075	0791	32518		2536	14806	0266	00090	2634
0100	0690 B	3279 B		2571	14774	0328	00145	2301
0125	0622 C	33258		2617	14757	0381	00205	1868
0150	0619 B	33596		2644	14764	0425	00266	1615
0175	0628 B	33735		2654	14774	0464	00332	1527
0200	0610 B	33828		2664	14772	0502	00404	1437
0225	0589	3387 C		2670	14769	0537	00481	1381
0250	0565	33891		2674	14763	0571	00565	1342
0300	0511	33906		2682	14749	0637	00750	1272
0400	0468	34018		2696	14750	0759	01186	1150
0500	0435 B	34114		2707	14754	0871	01697	1050
0600	0407 B	34193		2716	14759	0973	02271	0969

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0700	0382	34255		2723	14766	1067	02902	0903
0800	0355	3430 B		2730	14772	1156	03583	0847
1000	0308 B	34372		2740	14787	1318	05076	0757
1200	0273	34437		2748	14806	1464	06719	0682



C-REF-NO 005	YR 1963	DEPTH C 3657	WAVES 1 2723	AIR T 17.2	VIS 97
CONS. NO 007	MONTH 9	MXSAMPD 34	WAVES 2 2735	WET B 14.4	STN 007
LAT 49-26 N	DAY 12	NO.DPTH 23	WND-DIR 270	WW-CODE 60	
LON 136-40 W	HR 21.0	W-COLOR	WND-SPD 10	CLD-TPE 6	
MARSD SQ 158		W-TRNSP	BARO 1003.0	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
210	0000	166 B	32307		2356	15091
210	0010	1640	32298		2360	15086
210	0020	1642 B	32300		2360	15089
210	0030	1556 B	32330		2382	15064
210	0050	0888 B	32450		2516	14838
210	0075	0772	32553		2542	14799
210	0100	0690 B	32935		2583	14776
210	0125	0684 B	33510		2629	14785
210	0149	0672 B	33804		2654	14788
210	0174	0658 B	33890		2662	14788
210	0199	0637 B	33918		2667	14784
210	0249	0596	33945		2675	14776
210	0299	0552	33969		2682	14767
210	0399	0502	34045		2694	14764
220	0476	0466	34063		2699	14762
220	0711	0396	34257		2722	14774
220	0950	0334	34360		2736	14789
220	1189	0275	34426		2747	14805
220	1428	0248	34488		2754	14834
220	1911	0202	34571		2765	14897
220	2397	0177	34627		2771	14970
220	2887	0162	34652		2774	15048
220	3375	0159	34671		2776	15132

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1660 B	32307		2356	15091	0000	00000	4335
0010	1640	32298		2360	15086	0043	00002	4301
0020	1642 B	32300		2360	15089	0087	00009	4306
0030	1556 B	32330		2382	15064	0129	00020	4103
0050	0888 B	32450		2516	14838	0198	00047	2819
0075	0772	32553		2542	14799	0266	00090	2581
0100	0690 B	32935		2583	14776	0326	00143	2191
0125	0684 B	33510		2629	14785	0376	00200	1759
0150	0672 B	33810		2654	14788	0417	00258	1522
0175	0657 B	33892		2663	14788	0455	00320	1447
0200	0636 B	33919		2667	14784	0491	00389	1403
0225	0616	33935		2671	14780	0526	00465	1369
0250	0595	33945		2675	14776	0560	00548	1338

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0300	0551	33970		2682	14767	0626	00733	1272
0400	0502	34045		2694	14764	0749	01173	1168
0500	0457	3408 C		2702	14762	0863	01701	1101
0600	0425	3416 F		2711	14767	0970	02303	1015
0700	0399	34247		2721	14773	1068	02957	0928
0800	0372	34303		2728	14780	1159	03655	0865
1000	0320	34376		2739	14792	1324	05175	0768
1200	0273	34429		2748	14806	1472	06837	0688
1500	0240	34503		2756	14843	1670	09572	0612
2000	0196	34583		2766	14910	1958	14725	0524
2500	0173	34634		2772	14986	2213	20613	0477
3000	0161	34661		2775	15067	2451	27367	0456

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2769	AIR T 14.4	VIS 97
CONS. NO 008	MONTH 9	MXSAMPD 15	WAVES 2 2769	WET B 12.2	STN 010
LAT 49-50 N	DAY 14	NO.DPTH 19	WND-DIR 270	WW-CODE 02	
LON 142-40 W	HR 03.6	W-COLOR	WND-SPD 06	CLD-TPE 8	
MARSD SQ 159		W-TRNSP	BARO 1014.0	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
036	0000	145 B	32405		2410	15026
036	0010	1440	32338		2407	15024
036	0020	1440 B	32337		2407	15025
036	0030	1441	32336		2407	15027
036	0049	0842 B	32560		2532	14822
036	0074	0627	32634		2567	14742
036	0099	0538 B	32671		2581	14711
036	0124	0452 B	33059		2621	14685
036	0149	0422 B	33448		2655	14681
036	0174	0439 C	33688		2673	14696
036	0199	0401 B	33715		2679	14684
036	0248	0421 B	33846		2687	14703
036	0298	0404	33903		2693	14705
036	0399	0383	34013		2704	14714
041	0486	0377	34115		2713	14727
041	0731	0333 B	34290		2731	14751
041	0981	0297 B	34382		2742	14779
041	1234	0258				
041	1490	0228	34515		2758	14836

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1450 B	32405		2410	15026	0000	00000	3822
0010	1440	32338		2407	15024	0039	00002	3854
0020	1440 B	32337		2407	15025	0077	00008	3857
0030	1441	32336		2407	15027	0116	00018	3863
0050	0826 C	32566		2535	14816	0182	00043	2643
0075	0622	3263 B		2568	14741	0244	00083	2330
0100	0534 B	32683		2582	14710	0301	00134	2192
0125	0450 B	33076		2623	14684	0351	00191	1809
0150	0423 B	33461		2656	14682	0393	00249	1494
0175	0438 C	33691		2673	14696	0429	00309	1340
0200	0401 B	33718		2679	14685	0462	00372	1284
0225	0406 D	3378 D		2683	14692	0494	00442	1242
0250	0421 B	33849		2687	14703	0524	00517	1210
0300	0403	33905		2693	14705	0584	00685	1154
0400	0383	34014		2704	14714	0696	01084	1060
0500	0375	34128		2714	14729	0798	01556	0974
0600	0358 B	3421 B		2722	14739	0893	02090	0902

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0700	0339 B	34275		2729	14749	0981	02678	0842
0800	0323 B	34321		2734	14759	1064	03316	0797
1000	0294 B	3441 F		2744	14781	1217	04726	0715
1200	0263	3447 E		2752	14802	1355	06280	0646
1500	0227	34515		2758	14837	1543	08878	0588



C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 1622	AIR T 14.9	VIS 97
CONS. NO 009	MONTH 9	MXSAMPC 39	WAVES 2 2734	WET B 13.8	STN
LAT 50-03 N	DAY 16	NO.DPTH 25	WND-DIR 170	WW-CODE 02	
LON 144-58 W	HR 19.6	W-COLOR	WND-SPD 05	CLD-TPE 7	
MARSD SQ 195		W-TRNSP	BARO 1015.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
196	0000	140 B	32446	618	2424	15010
196	0010	1355	32440	618	2432	14997
196	0020	1356 B	32441	616	2432	14999
196	0030	1355	32441	616	2432	15000
196	0050	0696 B	32657	711	2560	14766
196	0074	0578	32677	689	2577	14723
196	0099	0514 B	32722	698	2588	14702
196	0124	0457 B	32922	655	2610	14685
196	0149	0374 B	33359	554	2653	14660
196	0173	0364 B	33569	462	2671	14662
196	0198	0357	33684	366	2681	14665
196	0247	0354	33802	254 B	2690	14674
196	0296	0364	33894	192	2697	14687
196	0395	0371	34033	Q 151	2707	14708
207	0450	0367 B	34118	110 B	2714	14717
207	0680	0332 B	34270	080	2730	14742
207	0905	0298	34372	064	2741	14766
207	1137	0265	34447	058	2750	14792
207	1370	0244	34493	068	2755	14823
207	1838	0204	34576	102	2765	14886
207	2312	0182 B	34625	175	2771	14958
207	2787	0164	34658	239	2775	15032
207	3265	0153	34674	279	2777	15110
207	3747	0151	34687	315	2778	15194
207	3938	0154	34690	353	2778	15229

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1400 B	32446	618	2424	15010	0000	00000	3693
0010	1355	32440	618	2432	14997	0037	00002	3613
0020	1356 B	32441	616	2432	14999	0073	00007	3616
0030	1355	32441	616	2432	15000	0109	00017	3617
0050	0696 B	32657	711	2560	14766	0170	00040	2400
0075	0575	32677	690	2577	14722	0228	00077	2240
0100	0512 B	32726	697	2588	14701	0283	00127	2135
0125	0453 B	3294 B	651	2612	14684	0334	00185	1915
0150	0373 B	33371	550	2654	14660	0378	00245	1513
0175	0363 B	33581	454	2672	14663	0414	00305	1348
0200	0357	33690	360	2681	14665	0446	00368	1261

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0225	0354	3376 C	295 B	2687	14669	0478	00436	1208
0250	0354	33808	249 B	2691	14674	0508	00509	1174
0300	0365	33900	190	2697	14688	0565	00672	1119
0400	0371	34041	147	2708	14709	0674	01059	1027
0500	0361 B	3417 D	093 C	2719	14723	0772	01513	0930
0600	0346 B	3424 E	077 C	2726	14734	0863	02025	0869
0700	0329 B	34281	078	2731	14744	0949	02597	0827
0800	0314	34329	070	2736	14755	1030	03223	0782
1000	0284	34406	060	2745	14777	1181	04608	0705
1200	0259	34461	060	2751	14800	1318	06155	0649
1500	0232	34518	075	2758	14840	1507	08766	0592
2000	0195	34596	125	2767	14910	1787	13785	0514
2500	0174	34640	202	2773	14987	2039	19602	0474
3000	0158	34666	259	2776	15067	2274	26282	0449
3500	0151	34681	291 B	2778	15151	2502	33946	0442

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 1822	AIR T 13.8	VIS 97
CONS. NO 010	MONTH 9	MXSAMPD 04	WAVES 2 2635	WET B 12.7	STN
LAT 50-04 N	DAY 18	NO.DPTH 14	WND-DIR 180	WW-CODE 02	
LON 144-54 W	HR 19.9	W-COLOR	WND-SPD 08	CLD-TPE 7	
MARSD SQ 195		W-TRNSP	BARO 1016.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
199	0000	138 B	32431	617 B	2427	15003
199	0010	1346	32434	625 B	2434	14994
199	0020	1346 B	32434	624 B	2434	14995
199	0030	1348	32435	619 B	2433	14998
199	0050	0700 B	32653	706 B	2559	14768
199	0074	0586	32670	691	2575	14726
199	0098	0524 B	32710	703 B	2586	14706
199	0123	0475 B	32781	700 B	2597	14690
199	0147	0388 B	33252	577 B	2643	14664
199	0171	0362	33511	489 B	2666	14661
199	0196	0363	33631	422 B	2676	14667
199	0245	0360	33741	314 B	2685	14675
199	0294	0357	33824	249 B	2692	14683
199	0394	0375	33991	167 B	2703	14709

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1380 B	32431	617 B	2427	15003	0000	00000	3665
0010	1346	32434	625 B	2434	14994	0037	00002	3600
0020	1346 B	32434	624 B	2434	14995	0073	00007	3602
0030	1348	32435	619 B	2433	14998	0109	00017	3608
0050	0700 B	32653	706 B	2559	14768	0169	00040	2408
0075	0583	32671	691	2576	14725	0228	00078	2254
0100	0521 B	32710	705 B	2586	14704	0284	00127	2159
0125	0467 B	32820	691 B	2600	14688	0336	00188	2022
0150	0382 B	33294	564 B	2647	14663	0382	00251	1580
0175	0361	3354 B	477 B	2668	14661	0419	00313	1379
0200	0363	33644	412 B	2677	14667	0453	00378	1302
0225	0362	33710	354 B	2682	14672	0485	00448	1254
0250	0360	33750	306 B	2686	14676	0516	00524	1222
0300	0359	3384 B	235 B	2693	14685	0576	00693	1157
0400	0377	33999	166 B	2704	14711	0688	01093	1064

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2723	AIR T 12.7	VIS 97
CONS. NO 011	MONTH 9	MXSAMPD 04	WAVES 2 2737	WET B 10.5	STN
LAT 50-03 N	DAY 20	NO.DPTH 14	WND-DIR 270	WW-CODE 02	
LON 145-02 W	HR 19.7	W-COLOR	WND-SPD 10	CLD-TPE 8	
MARSD SQ 195		W-TRNSP 13	BARO 1004.0	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
197	0000	136 B	32441	626 B	2431	14997
197	0010	1346	32434	636 B	2434	14994
197	0020	1344 B	32431	612 B	2434	14995
197	0030	1314	32451	617 B	2441	14987
197	0050	0669 B	32670	696 B	2565	14756
197	0075	0574	32697	699 B	2579	14722
197	0100	0514 B	32720	702 B	2588	14702
197	0125	0458 B	32912	651 B	2609	14685
197	0150	0372 B	33334	562 B	2651	14659
197	0175	0365 C	33527	454 B	2667	14663
197	0200	0370	33655	400 B	2677	14671
197	0250	0353	33764	267 B	2687	14673
197	0300	0360	33851	203 B	2693	14686
197	0400	0373	34006	155 B	2705	14710

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1360 B	32441	626 B	2431	14997	0000	00000	3619
0010	1346	32434	636 B	2434	14994	0036	00002	3600
0020	1344 B	32431	612 B	2434	14995	0072	00007	3601
0030	1314	32451	617 B	2441	14987	0108	00017	3532
0050	0669 B	32670	696 B	2565	14756	0168	00040	2356
0075	0574	32697	699 B	2579	14722	0225	00076	2224
0100	0514 B	32720	702 B	2588	14702	0280	00126	2142
0125	0458 B	32912	651 B	2609	14685	0331	00184	1941
0150	0372 B	33334	562 B	2651	14659	0375	00246	1540
0175	0365 C	33527	454 B	2667	14663	0412	00307	1390
0200	0370	33655	400 B	2677	14671	0446	00372	1300
0225	0362 B	3372 D	331 B	2683	14672	0478	00442	1243
0250	0353	33764	267 B	2687	14673	0509	00517	1206
0300	0360	33851	203 B	2693	14685	0568	00684	1151
0400	0373	34006	155 B	2705	14710	0680	01082	1055



C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 1624	AIR T 14.4	VIS
CONS. NO 012	MONTH 9	MXSAMPD 04	WAVES 2 49X5	WET B 12.7	STN
LAT 50-08 N	DAY 23	NO.DPTH 14	WND-DIR 160	WW-CODE 02	
LON 145-01 W	HR 19.8	W-COLOR	WND-SPD 09	CLD-TPE 8	
MARSD SQ 195		W-TRNSP 09	BARO 985.0	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
198	0000	135 B	32447	610	2434	14994
198	0010	1330 B	32446	650 B	2438	14989
198	0020	1328 B	32445	644 B	2438	14990
198	0030	1077 B	32554	663 B	2493	14905
198	0050	0663 B	32682	691 B	2567	14754
198	0075	0580	32699	693 B	2578	14725
198	0100	0519 B	32724	706 B	2587	14704
198	0125	0437 C	33020	638 B	2620	14678
198	0150	0369 B	33433	533 B	2659	14659
198	0175	0366 C	33620	445 B	2675	14664
198	0200	0364	33693	364 B	2681	14669
198	0250	0353	33779	269 B	2688	14673
198	0300	0363 B	33866	201 B	2694	14687
198	0400	0369	34009	141 B	2705	14708

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN.	SVA
0000	1350 B	32447	610	2434	14994	0000	00000	3596
0010	1330 B	32446	650 B	2438	14989	0036	00002	3561
0020	1328 B	32445	644 B	2438	14990	0072	00007	3560
0030	1077 B	32554	663 B	2493	14905	0105	00016	3035
0050	0663 B	32682	691 B	2567	14754	0159	00037	2339
0075	0580	32699	693 B	2578	14725	0216	00074	2230
0100	0519 B	32724	706 B	2587	14704	0272	00123	2145
0125	0437 C	33020	638 B	2620	14678	0322	00180	1838
0150	0369 B	33433	533 B	2659	14659	0363	00238	1462
0175	0366 C	33620	445 B	2675	14664	0398	00297	1321
0200	0364	33693	364 B	2681	14669	0431	00359	1266
0225	0358	3374 B	309 B	2685	14671	0462	00428	1226
0250	0353	33779	269 B	2688	14673	0493	00502	1194
0300	0363 B	33866	201 B	2694	14687	0552	00668	1142
0400	0369	34009	141 B	2705	14708	0662	01063	1049

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2523	AIR T 12.2	VIS 97
CONS. NO 013	MONTH 9	MXSAMPC 19	WAVES 2 2936	WET B 11.1	STN
LAT 50-02 N	DAY 24	NO.DPTH 20	WND-DIR 250	WW-CODE 02	
LON 144-59 W	HR 18.8	W-COLOR	WND-SPD 10	CLD-TPE 8	
MARSD SQ 195		W-TRNSP 11	BARO 998.0	CLD-AMT 3	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
188	0000	134 B	32453	618	2436	14990
188	0010	1329	32453	660 B	2439	14988
188	0020	1330 B	32452	656 B	2438	14990
188	0030	1174 D	32507	633 B	2472	14939
188	0050	0646 B	32679	696 B	2569	14747
188	0075	0555	32697	715 B	2581	14714
188	0100	0494 B	32762	705 B	2593	14694
188	0125	0422 B	33035	635 B	2623	14672
188	0150	0350 B	33442	508 B	2662	14651
188	0175	0362 B	33620	422 B	2675	14663
188	0200	0364	33698	356 B	2681	14669
188	0250	0350	33771	268 B	2688	14672
188	0300	0358 B	33857	214 B	2694	14685
188	0400	0367	34010	134 B	2705	14707
194	0468	0360	34082	115 B	2712	14716
194	0700	0332	34275	063 B	2730	14746
194	0935	0296 B	34374	Q 079 B	2741	14771
194	1176	0260	34447	060	2750	14796
194	1420	0236	34504	075 B	2757	14828
194	1916	0199	34585	085 B	2766	14897

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1340 B	32453	618	2436	14990	0000	00000	3572
0010	1329	32453	660 B	2439	14988	0036	00002	3554
0020	1330 B	32452	656 B	2438	14990	0072	00007	3559
0030	1174 D	32507	633 B	2472	14939	0106	00016	3235
0050	0646 B	32679	696 B	2569	14747	0162	00038	2321
0075	0555	32697	715 B	2581	14714	0219	00074	2203
0100	0494 B	32762	705 B	2593	14694	0273	00123	2089
0125	0422 B	33035	635 B	2623	14672	0322	00179	1812
0150	0350 B	33442	508 B	2662	14651	0363	00236	1438
0175	0362 B	33620	422 B	2675	14663	0397	00294	1317
0200	0364	33698	356 B	2681	14669	0430	00356	1262
0225	0357	3374 C	306 B	2685	14670	0461	00424	1225
0250	0350	33771	268 B	2688	14672	0492	00499	1197
0300	0358 B	33857	214 B	2694	14685	0551	00665	1144
0400	0367	34010	134 B	2705	14707	0661	01060	1046
0500	0357	34114	105 B	2715	14721	0763	01528	0966

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0600	0345	34203	080 B	2723	14733	0857	02057	0895
0700	0332	34275	063 B	2730	14746	0944	02639	0834
0800	0317	3433 B	068 B	2735	14756	1026	03271	0788
1000	0286 B	34396	074 B	2744	14777	1178	04672	0715
1200	0257	34453	061	2751	14799	1317	06235	0653
1500	0226	34522	066 C	2759	14837	1505	08832	0583

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 09XX	AIR T 12.7	VIS 97
CONS. NO 014	MONTH 9	MXSAMPD 04	WAVES 2 49X2	WET B 10.5	STN
LAT 50-02 N	DAY 27	NO.DPTH 14	WND-DIR 090	WW-CODE 02	
LON 145-00 W	HR 19.7	W-COLOR	WND-SPD 02	CLD-TPE 6	
MARSD SQ 195		W-TRNSP	BARO 1021.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
197	0000	134 B	32464	614	2437	14991
197	0010	1310 B	32460	614	2443	14982
197	0020	1312 B	32459	606	2442	14984
197	0030	1313	32459	593	2442	14986
197	0050	0667 B	32679	701 B	2566	14755
197	0075	0570	32690	697	2579	14720
197	0100	0504 B	32747	705	2591	14698
197	0125	0414 B	33127	625 B	2631	14670
197	0150	0350 B	33441	508 B	2662	14651
197	0175	0347	33619	410 B	2676	14656
197	0200	0361	33705	359 B	2682	14667
197	0250	0357	33793	259 B	2689	14675
197	0300	0362	33880	198 B	2696	14687
197	0400	0367	34033	148 B	2707	14707

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1340 B	32464	614	2437	14991	0000	00000	3564
0010	1310 B	32460	614	2443	14982	0036	00002	3513
0020	1312 B	32459	606	2442	14984	0071	00007	3520
0030	1313	32459	593	2442	14986	0106	00016	3524
0050	0667 B	32679	701 B	2566	14755	0165	00039	2347
0075	0570	32690	697	2579	14720	0223	00076	2225
0100	0504 B	32747	705	2591	14698	0277	00125	2111
0125	0414 B	33127	625 B	2631	14670	0326	00180	1734
0150	0350 B	33441	508 B	2662	14651	0366	00236	1438
0175	0347	33619	410 B	2676	14656	0400	00293	1303
0200	0361	33705	359 B	2682	14667	0433	00355	1254
0225	0361	3376 B	306 B	2686	14672	0464	00423	1218
0250	0357	33793	259 B	2689	14675	0494	00497	1188
0300	0362	33880	198 B	2696	14687	0553	00662	1131
0400	0367	34033	148 B	2707	14707	0662	01051	1029



C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2335	AIR T 12.7	VIS 96
CONS. NO 015	MONTH 9	MXSAMPD 04	WAVES 2 2349	WET B 11.1	STN
LAT 50-04 N	DAY 30	NO.DPTH 14	WND-DIR 230	WW-CODE 65	
LON 144-52 W	HR 19.7	W-COLOR	WND-SPD 10	CLD-TPE 5	
MARSD SQ 195		W-TRNSP 08	BARO 1002.0	CLD-AMT 8	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
197	0000	128 B	32410	614 B	2445	14970
197	0009	1267 B	32411	620 B	2448	14967
197	0019	1269 B	32414	619 B	2447	14969
197	0028	1267 B	32419	620 B	2448	14970
197	0047	0660 B	32664	684 B	2566	14752
197	0071	0564	32670	696	2578	14717
197	0095	0528 B	32730	701	2587	14707
197	0119	0432 B	33063	626	2624	14676
197	0143	0370 B	33413	542 B	2658	14658
197	0168	0371 B	33609	444 B	2673	14665
197	0192	0374	33687	379 B	2679	14671
197	0241	0370	33781	279 B	2687	14679
197	0290	0378 B	33880	218 B	2694	14692
197	0390	0370	34013	159 B	2705	14707

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1280 B	32410	614 B	2445	14970	0000	00000	3491
0010	1267 B	32411	620 B	2448	14967	0035	00002	3468
0020	1273 B	32413	619 B	2446	14971	0070	00007	3482
0030	1211 I	3244 D	626 B	2461	14951	0104	00016	3349
0050	0626 G	3267 D	688 B	2571	14739	0161	00038	2301
0075	0558 B	3267 C	700	2579	14715	0218	00075	2227
0100	0509 B	3279 D	689	2594	14701	0272	00123	2086
0125	0412 B	3316 C	606	2633	14669	0320	00178	1710
0150	0367 B	33482	514 B	2664	14659	0360	00233	1423
0175	0372 B	3364 B	423 B	2675	14667	0394	00290	1313
0200	0373	33705	360 B	2681	14673	0427	00352	1266
0225	0371	3376 B	307 B	2685	14677	0458	00421	1229
0250	0371	33800	266 B	2688	14681	0489	00496	1197
0300	0373 B	3389 B	203 B	2695	14691	0547	00661	1135
0400	0370	34024	160 B	2706	14708	0657	01053	1038

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2235	AIR T 14.4	VIS 97
CONS. NO 016	MONTH 10	MXSAMPD 20	WAVES 2 2749	WET B 13.3	STN
LAT 50-00 N	DAY 01	NO.DPTH 20	WND-DIR 220	WW-CODE 02	
LON 144-55 W	HR 19.2	W-COLOR	WND-SPD 10	CLD-TPE 8	
MARSD SQ 195		W-TRNSP 11	BARO 1007.0	CLD-AMT 4	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
200	0000	131 B	32447	619 B	2442	14980
200	0010	1286 B	32439	617	2446	14974
200	0019	1289	32439	621	2445	14976
200	0029	1290	32438	614	2445	14978
200	0048	0698 F	32681	696 B	2562	14767
200	0072	0578	32668	695 B	2576	14723
200	0097	0526	32719	702	2586	14706
200	0121	0438 B	32960	648 B	2615	14677
200	0146	0364	33378	549 B	2656	14655
200	0170	0344	33516	469 B	2668	14653
200	0195	0361	33680	366 B	2680	14666
200	0244	0358	33781	269 B	2688	14674
200	0293	0357 B	33854	204 B	2694	14683
200	0392	0367	34008	149 B	2705	14706
192	0469	0358 B	34125	103	2715	14716
192	0709	0333	34252	073 B	2728	14747
192	0957	0297	34380	073 B	2742	14775
192	1203		34448	070 B		
192	1452	0236 B	34506	083 B	2757	14833
192	1951	0208	34566	115 B	2764	14906

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1310 B	32447	619 B	2442	14980	0000	00000	3520
0010	1286 B	32439	617	2446	14974	0035	00002	3483
0020	1294 B	32437	620	2444	14978	0070	00007	3502
0030	1263 E	3245 B	618	2451	14969	0105	00016	3438
0050	0673 G	3269 C	698 B	2566	14758	0163	00039	2350
0075	0571	3267 B	697 B	2577	14720	0221	00076	2243
0100	0516	32740	698	2589	14703	0276	00125	2129
0125	0424 B	3303 E	633 B	2622	14673	0326	00182	1817
0150	0358	3341 C	536 B	2659	14654	0367	00240	1470
0175	0346	3355 B	448 B	2671	14655	0403	00299	1354
0200	0362	3370 B	352 B	2681	14668	0436	00362	1260
0225	0362	3376 E	296 B	2686	14673	0467	00430	1215
0250	0358	33791	260 B	2689	14675	0497	00504	1190
0300	0358 B	33865	199 B	2695	14685	0556	00669	1138
0400	0366	34021	144 B	2706	14707	0666	01061	1037
0500	0355 B	3415 D	093	2718	14720	0765	01519	0936

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0600	0345 B	3422 G	074 B	2724	14734	0857	02037	0884
0700	0334	34251	072 B	2728	14746	0945	02624	0855
0800	0320	34303	071 B	2733	14757	1029	03271	0808
1000	0291	34394	072 B	2743	14779	1184	04696	0721
1200	0264	34447	070 B	2750	14802	1324	06280	0665
1500	0235 B	34513	082 B	2758	14841	1517	08939	0599
2000	0206	34569	120 B	2764	14914	1808	14161	0547

C-REF-NO 005	YR 1963	DEPTH		WAVES 1 3522	AIR T 12.2	VIS 97
CONS. NO 017	MONTH 10	MXSAMPD 41		WAVES 2 3245	WET B 10.5	STN
LAT 50-03 N	DAY 04	NO.DPTH 25		WND-DIR 350	WW-CODE 02	
LON 144-52 W	HR 20.2	W-COLOR		WND-SPD 13	CLD-TPE 8	
MARSD SQ 195		W-TRNSP 12		BARO 1022.0	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
226	0000	125 B	32463	624 B	2455	14960
226	0010	1241 B	32458	624 B	2456	14959
226	0019	1244	32458	629 B	2456	14961
226	0029	1245	32458	619 B	2455	14963
226	0048	0700	32675	689 B	2561	14768
226	0072	0596 B	32725	691 B	2578	14731
226	0096	0526 B	32751	697 B	2589	14707
226	0121	0437 B	32987	641 B	2617	14677
226	0145	0363	33344	550 B	2653	14654
226	0169	0346	33533	463 B	2670	14654
226	0192	0352	33658	384 B	2679	14662
226	0240	0356	33786	253 B	2689	14673
226	0288	0359 B	33863	200 B	2695	14683
226	0386	0367	34005	137 B	2705	14705
202	0483	0360 C	34093	113 B	2713	14719
202	0719	0328	34285	079 B	2731	14747
202	0962	0293	34382	Q 076 B	2742	14774
202	1207	0259	34450	059 B	2750	14801
202	1453	0235	34508	076 B	2757	14833
202	1950	0197	34583	124 B	2766	14902
202	2444	0176 B	34629	205 B	2771	14978
202	2937	0160	34658	236	2775	15056
202	3428	0152	34674	292 B	2777	15138
202	3922	0152	34680	330 B	2777	15225
202	4120	0155 B	34686	365 B	2778	15262

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1250 B	32463	624 B	2455	14960	0000	00000	3397
0010	1241 B	32458	624 B	2456	14959	0034	00002	3387
0020	1249 B	32456	628 B	2455	14963	0068	00007	3404
0030	1220 E	3247 B	622 B	2461	14955	0102	00016	3346
0050	0678 D	3268 B	691 B	2565	14760	0160	00038	2357
0075	0587 B	3272 B	693 B	2579	14728	0217	00075	2219
0100	0512 B	32777	692 B	2592	14702	0271	00123	2097
0125	0422 B	3305 D	627 B	2624	14672	0321	00180	1802
0150	0356	3339 B	532 B	2657	14653	0362	00237	1481
0175	0347	33570	442 B	2672	14655	0397	00296	1340
0200	0353	3369 B	358 B	2681	14664	0430	00359	1260



DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0225	0355	3376 B	287 B	2687	14670	0461	00427	1210
0250	0357	33804	238 B	2690	14675	0491	00500	1179
0300	0360 B	33882	190 B	2696	14686	0550	00664	1128
0400	0367	34019	132 B	2706	14707	0659	01055	1039
0500	0358 C	34109	109 B	2714	14721	0760	01522	0971
0600	0346 B	3420 B	092 B	2722	14734	0855	02055	0900
0700	0331	34272	081 B	2730	14745	0943	02639	0836
0800	0316	3433 B	077 B	2735	14756	1025	03271	0788
1000	0287	34394	073 B	2743	14778	1177	04675	0718
1200	0260	34448	059 B	2750	14800	1317	06249	0659
1500	0231	34517	079 B	2758	14839	1507	08880	0592
2000	0194	34589	133 B	2767	14909	1789	13920	0518
2500	0174 B	34633	209 B	2772	14986	2042	19788	0478
3000	0159	34661	243	2775	15067	2280	26535	0454
3500	0151	34675	296 B	2777	15151	2511	34289	0448
4000	0153	34684	348 B	2778	15240	2743	43321	0458

C-REF-NO 005 YR 1963 DEPTH C 4023 WAVES 1 2922 AIR T 11.1 VIS 97  
 CONS. NO 018 MONTH 10 MXSAMPD 04 WAVES 2 2747 WET B 09.4 STN  
 LAT 49-56 N DAY 07 NO.DPTH 14 WND-DIR 290 WW-CODE 02  
 LON 144-52 W HR 19.6 W-COLOR WND-SPD 07 CLD-TPE 6  
 MARSD SQ 159 W-TRNSP 10 BARO 1012.0 CLD-AMT 5 HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
196	0000	124 B	32474	623	2458	14957
196	0010	1222 B	32440	603	2458	14952
196	0019	1224 B	32439	632	2458	14954
196	0028	1226	32438	621	2457	14956
196	0047	0737	32681	685 B	2557	14782
196	0071	0599	32685	688 B	2575	14731
196	0094	0530 B	32721	692 B	2586	14708
196	0118	0464 B	32882	658 B	2606	14686
196	0141	0376 B	33272	573 B	2646	14658
196	0165	0345 B	33461	496 B	2664	14652
196	0189	0356	33615	421 B	2675	14662
196	0236	0362	33746	307 B	2685	14674
196	0283	0362 B	33831	236 B	2692	14683
196	0379	0366	33967	157 B	2702	14703

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1240 B	32474	623	2458	14957	0000	00000	3371
0010	1222 B	32440	603	2458	14952	0034	00002	3366
0020	1228 B	32437	631	2457	14955	0068	00007	3381
0030	1182 H	3246 D	626	2467	14942	0101	00016	3284
0050	0703 D	3269 D	688 B	2562	14770	0158	00038	2385
0075	0585	32686	690 B	2577	14726	0217	00075	2245
0100	0514 B	3274 B	688 B	2589	14702	0272	00124	2125
0125	0435 B	3300 H	634 B	2618	14677	0322	00182	1852
0150	0358 B	3336 D	543 B	2654	14653	0364	00241	1509
0175	0347 B	33531	464 B	2669	14655	0400	00301	1370
0200	0359	3366 C	390 B	2678	14666	0434	00365	1287
0225	0362	3373 C	330 B	2684	14672	0466	00435	1240
0250	0362	33774	282 B	2687	14677	0496	00510	1207
0300	0365	3387 C	209 B	2695	14688	0556	00677	1141

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 3236	AIR T 08.8	VIS
CONS. NO 019	MONTH 10	MXSAMPD 19	WAVES 2 7960	WET B 06.6	STN
LAT 50-01 N	DAY 08	NO.DPTH 20	WND-DIR 330	WW-CODE 64	
LON 145-00 W	HR 18.9	W-COLOR	WND-SPD 10	CLD-TPE 5	
MARSD SQ 195		W-TRNSP 12	BARO 1004.0	CLD-AMT 5	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
189	0000	121 B	32441	627 B	2461	14946
189	0010	1218 B	32445	626 B	2459	14950
189	0019	1222	32443	630 B	2459	14953
189	0029	1224	32443	627 B	2458	14956
189	0048	0721	32718	696 B	2562	14777
189	0072	0584	32691	704 B	2577	14726
189	0096	0515	32755	717 B	2590	14702
189	0120	0410 B	33124	606	2631	14667
189	0144	0350 B	33387	563 B	2658	14649
189	0167	0342	33566	448 B	2673	14652
189	0191	0367	33667	389 B	2678	14668
189	0239	0362	33771	287 B	2687	14675
189	0287	0363 B	33850	220 B	2693	14685
189	0385	0366	33998	135 B	2705	14704
196	0470	0365	34072	117 B	2711	14719
196	0706	0330	34265	074 B	2729	14746
196	0943	0292	34375	Q 071 B	2742	14770
196	1183	0260	34448	063 B	2750	14798
196	1425	0234	34507	073 B	2757	14828
196	1923	0199		156 B		

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1210 B	32441	627 B	2461	14946	0000	00000	3341
0010	1218 B	32445	626 B	2459	14950	0034	00002	3355
0020	1226 B	32441	629 B	2458	14955	0067	00007	3375
0030	1201 D	3246 C	630 B	2463	14948	0101	00016	3321
0050	0698 C	3272 C	698 B	2565	14768	0158	00038	2353
0075	0575	3269 B	709 B	2578	14722	0216	00075	2232
0100	0497	3281 E	700 B	2597	14696	0270	00123	2057
0125	0393 B	33186	597 B	2637	14662	0317	00176	1670
0150	0344 B	33441	534 B	2662	14648	0356	00231	1433
0175	0349	33606	425 B	2675	14657	0391	00289	1315
0200	0369	3369 B	368 B	2680	14671	0423	00351	1271
0225	0367 B	3375 B	314 B	2685	14675	0455	00420	1229
0250	0362	33790	269 B	2688	14677	0485	00494	1194
0300	0363 B	33872	205 B	2695	14687	0544	00660	1138
0400	0366	34013	130 B	2706	14707	0654	01053	1043
0500	0362	34099	110 B	2713	14723	0756	01525	0982

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0600	0349	3419 B	090 B	2721	14735	0852	02064	0912
0700	0331	34261	075 B	2729	14745	0941	02655	0844
0800	0315	34316	071 B	2735	14755	1023	03292	0792
1000	0284	34395	069 B	2744	14776	1176	04695	0714
1200	0258	34457	063 B	2751	14800	1314	06254	0651
1500	0227		081 B					



C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2223	AIR T 11.6	VIS 97
CONS. NO 020	MONTH 10	MXSAMPD 04	WAVES 2 0525	WET B 10.5	STN
LAT 50-01 N	DAY 11	NO.DPTH 14	WND-DIR 220	WW-CODE 15	
LON 145-01 W	HR 19.8	W-COLOR	WND-SPD 10	CLD-TPE 7	
MARSD SQ 195		W-TRNSP 12	BARO 980.0	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
198	0000	118 B	32452	633	2467	14936
198	0010	1170 B	32450	624	2469	14934
198	0019	1172	32448	625	2468	14936
198	0029	1174	32449	626	2468	14938
198	0048	0952	32605	674 B	2518	14863
198	0072	0618	32692	682	2573	14739
198	0097	0538 B	32748	689	2587	14712
198	0121	0438	33039	632	2621	14678
198	0145	0350	33408	522	2659	14650
198	0169	0343	33564	434	2672	14653
198	0193	0364	33673	Q 395	2679	14667
198	0241	0361	33769	281	2687	14675
198	0290	0362 B	33843	212	2693	14685
198	0386	0366	33995	138	2704	14704

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1180 B	32452	633	2467	14936	0000	00000	3280
0010	1170 B	32450	624	2469	14934	0033	00002	3266
0020	1174	32447	625	2468	14937	0066	00007	3278
0030	1166	3246 B	628	2470	14936	0099	00015	3260
0050	0920 B	32615	676 B	2524	14852	0159	00039	2745
0075	0602 C	3269 C	685	2575	14733	0222	00079	2260
0100	0526 B	3278 B	685	2591	14707	0277	00128	2113
0125	0420	3311 C	615	2628	14672	0326	00184	1757
0150	0344	3345 B	501	2663	14649	0366	00240	1425
0175	0348	33595	423	2674	14656	0400	00297	1322
0200	0365	3369 B	378	2680	14669	0433	00360	1267
0225	0365	3375 C	319	2685	14674	0465	00428	1228
0250	0361	33783	266	2688	14677	0495	00503	1199
0300	0361	3387 B	193 B	2695	14686	0554	00669	1141

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 3234	AIR T 09.4	VIS 97
CONS. NO 021	MONTH 10	MXSAMPD 04	WAVES 2 3448	WET B 06.6	STN
LAT 49-56 N	DAY 14	NO.DPTH 14	WND-DIR 320	WW-CODE 02	
LON 145-02 W	HR 19.7	W-COLOR	WND-SPD 09	CLD-TPE 8	
MARSD SQ 159		W-TRNSP	BARO 1005.0	CLD-AMT 6	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
197	0000	108 B	32490	634 B	2488	14901
197	0010	1111 B	32488	631 B	2482	14913
197	0020	1114 B	32486	632 B	2482	14916
197	0030	1115	32486	626 B	2482	14918
197	0049	0638	32721	706 B	2573	14744
197	0074	0564	32737	700 B	2583	14718
197	0098	0493	32825	696	2598	14694
197	0123	0395	33234	597 B	2641	14663
197	0148	0348 B	33466	501 B	2664	14650
197	0172	0343	33581	433 B	2674	14654
197	0197	0358	33691	356 B	2681	14666
197	0246	0359	33794	255 B	2689	14675
197	0295	0359 B	33870	186 B	2695	14685
197	0394	0361	34023	117	2707	14704

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1080 B	32490	634 B	2488	14901	0000	00000	3081
0010	1111 B	32488	631 B	2482	14913	0031	00002	3137
0020	1114 B	32486	632 B	2482	14916	0063	00006	3145
0030	1115	32486	626 B	2482	14918	0094	00015	3149
0050	0629 B	3272 B	707 B	2574	14741	0149	00036	2266
0075	0561	32737	701 B	2584	14717	0205	00072	2180
0100	0485	3286 C	690	2602	14692	0258	00119	2009
0125	0390	33258	589 B	2643	14661	0303	00171	1612
0150	0346 B	33478	495 B	2665	14650	0341	00224	1408
0175	0345	33595	423 B	2675	14655	0376	00281	1319
0200	0359	33700	348 B	2682	14666	0408	00344	1256
0225	0361	3376 C	292 B	2686	14672	0439	00411	1214
0250	0359	33801	248 B	2690	14676	0469	00485	1184
0300	0359	3389 B	178 B	2696	14686	0528	00649	1125
0400	0361	34031	116	2708	14705	0636	01036	1025

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2225	AIR T 11.6	VIS 97
CONS. NO 022	MONTH 10	MXSAMPD 04	WAVES 2 2735	WET B 09.9	STN
LAT 50-04 N	DAY 15	NO.DPTH 14	WND-DIR 220	WW-CODE 02	
LON 144-45 W	HR 19.2	W-COLOR	WND-SPD 15	CLD-TPE 8	
MARSD SQ 195		W-TRNSP	BARO 1001.0	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
192	0000	121 B	32475	630	2463	14946
192	0010	1118 B	32474	628 B	2480	14916
192	0020	1120 B	32473	630	2480	14918
192	0030	1120	32473	628	2480	14920
192	0050	0654	32686	682	2568	14750
192	0075	0572	32745	690 B	2583	14722
192	0100	0498 B	32828	686	2598	14697
192	0125	0410	33172	607	2635	14669
192	0150	0364	33449	524	2661	14657
192	0175	0351	33578	443	2673	14657
192	0200	0356	33686	373	2681	14665
192	0250	0364	33799	264	2689	14678
192	0300	0360		195		
192	0400	0365	34031	129	2707	14707

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1210 B	32475	630	2463	14946	0000	00000	3316
0010	1118 B	32474	628 B	2480	14916	0033	00002	3159
0020	1120 B	32473	630	2480	14918	0064	00007	3165
0030	1120	32473	628	2480	14920	0096	00015	3167
0050	0654	32686	682	2568	14750	0151	00036	2325
0075	0572	32745	690 B	2583	14722	0208	00073	2186
0100	0498 B	32828	686	2598	14697	0261	00120	2044
0125	0410	33172	607	2635	14669	0309	00174	1697
0150	0364	33449	524	2661	14657	0348	00229	1446
0175	0351	33578	443	2673	14657	0383	00288	1338
0200	0356	33686	373	2681	14665	0416	00351	1263
0225	0361	3375 C	313	2686	14672	0447	00419	1220
0250	0364	33799	264	2689	14678	0478	00493	1190
0300	0360	3394 I	195	2701	14687	0535	00654	1084
0400	0365	34031	129	2707	14707	0642	01036	1029

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 2224	AIR T 09.4	VIS 97
CONS. NO 023	MONTH 10	MXSAMPC 19	WAVES 2 2637	WET B 07.7	STN
LAT 50-00 N	DAY 18	NO.DPTH 20	WND-DIR 180	WW-CODE 02	
LON 145-06 W	HR 20.6	W-COLOR	WND-SPD 08	CLD-TPE 8	
MARSD SQ 195		W-TRNSP	BARO 1005.0	CLD-AMT 7	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
206	0000	107 B	32499	642 B	2490	14897
206	0010	1052 B	32496	650 B	2493	14892
206	0019	1057 B	32496	651 B	2492	14896
206	0028	1057	32496	641 B	2492	14897
206	0047	1052	32498	644 B	2493	14898
206	0071	0586	32734	683	2580	14727
206	0094	0518 B	32757	712 B	2590	14703
206	0118	0450	32972	652 B	2615	14682
206	0141	0362 B	33341	553 B	2653	14653
206	0165	0340 B	33529	466 B	2670	14650
206	0188	0356	33654	388 B	2678	14663
206	0236	0355	33769	278 B	2687	14672
206	0285	0358	33839	208 B	2693	14682
206	0385	0362	33994	124 B	2705	14702
213	0476	0360 B	34094	100 B	2713	14718
213	0716	0328	34274	078 B	2730	14746
213	0959	0289	34376	074 B	2742	14772
213	1201	0258	34443	063 B	2750	14800
213	1445	0232	34504	075 B	2757	14830
213	1937	0197	34584	132 B	2766	14899

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	1070 B	32499	642 B	2490	14897	0000	00000	3058
0010	1052 B	32496	650 B	2493	14892	0031	00002	3033
0020	1057 B	32496	650 B	2492	14896	0061	00006	3043
0030	1064 C	3249 B	640 B	2491	14900	0092	00014	3059
0050	0997 H	3253 D	648 B	2505	14879	0152	00039	2929
0075	0561 E	3274 E	691	2584	14717	0216	00079	2178
0100	0502 B	32793	703 B	2595	14698	0270	00126	2074
0125	0421 B	3309 F	623 B	2627	14672	0318	00182	1772
0150	0347 B	3343 C	519 B	2661	14650	0359	00239	1447
0175	0345 B	33589	431 B	2674	14655	0394	00297	1324
0200	0358	3369 C	355 B	2681	14666	0426	00359	1259
0225	0357	3375 B	298 B	2686	14671	0457	00427	1216
0250	0356	33791	255 B	2689	14675	0488	00501	1188
0300	0359	33863	191 B	2695	14685	0546	00666	1140
0400	0362	34012	118 B	2706	14705	0656	01059	1039
0500	0358 B	34117	096 B	2715	14721	0758	01525	0965



DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0600	0346 B	34199	084 B	2723	14734	0852	02056	0898
0700	0331	34265	078 B	2729	14745	0940	02641	0840
0800	0314	34316	076 B	2735	14755	1022	03277	0792
1000	0283	34389	072 B	2743	14776	1175	04684	0717
1200	0258	34443	063 B	2750	14800	1315	06260	0661
1500	0227	34514	076 B	2758	14838	1505	08891	0590

C-REF-NO 005	YR 1963	DEPTH C 4023	WAVES 1 3022	AIR T 06.6	VIS 97
CONS. NO 024	MONTH 10	MXSAMPD 39	WAVES 2 3037	WET B 04.9	STN
LAT 49-56 N	DAY 25	NO.DPTH 25	WND-DIR 300	WW-CODE 02	
LON 144-27 W	HR 19.5	W-COLOR	WND-SPD 07	CLD-TPE 8	
MARSD SQ 159		W-TRNSP 16	BARO 1011.0	CLD-AMT 2	HW

## O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
195	0000	084 B	32560	678 B	2532	14813
195	0010	0832 B	32558	678 B	2533	14811
195	0019	0836	32558	679 B	2533	14814
195	0029	0836	32555	677 B	2533	14816
195	0049	0836	32555	680 B	2533	14819
195	0074	0670	32678	698 B	2565	14760
195	0099	0479 D	32897	686 B	2606	14690
195	0124	0385	33311	597 B	2648	14660
195	0148	0367 B	33475	508 B	2663	14658
195	0173	0355 B	33635	427 B	2677	14660
195	0198	0369	33738	340 B	2684	14671
195	0248	0358	33805	256 B	2690	14675
195	0298	0365 B	33887	194 B	2696	14688
195	0397	0367	34021	133	2706	14707
208	0445	0367 B	34080	Q140 B	2711	14716
208	0667	0336	34247	084 B	2727	14741
208	0889	0303	34360	063 B	2739	14766
208	1110	0270	34428	050 B	2748	14789
208	1334	0245	34481	080 B	2754	14817
208	1805	0206	34564	105	2764	14881
208	2286	0182	34614	189	2770	14953
208	2768	0163	34650	230 B	2774	15028
208	3250	0156	34668	273	2776	15109
208	3735	0152	34675	324	2777	15192
208	3930	0153	34683	333	2778	15227

## I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0000	0840 B	32560	678 B	2532	14813	0000	00000	2659
0010	0832 B	32558	678 B	2533	14811	0027	00001	2651
0020	0836	32558	679 B	2533	14815	0053	00005	2659
0030	0837	32554	677 B	2532	14817	0080	00012	2665
0050	0831	32558	681 B	2533	14818	0134	00034	2657
0075	C662	32684	699 B	2567	14757	0197	00074	2340
0100	0474 D	3291 B	683 B	2608	14688	0251	00122	1953
0125	0383	33320	593 B	2649	14659	0295	00172	1559
0150	0365 B	33489	501 B	2664	14658	0332	00225	1417
0175	0356 B	33645	420 B	2678	14660	0366	00282	1292
0200	0369	33742	335 B	2684	14671	0398	00343	1234

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT.EN	SVA
0225	0365 B	3379 D	286 B	2688	14674	0429	00410	1200
0250	0358	33808	253 B	2690	14676	0459	00483	1177
0300	0365 B	33890	192 B	2696	14688	0517	00647	1127
0400	0367	34025	133	2707	14707	0626	01036	1035
0500	0362 B	3413 B	131 C	2716	14723	0727	01500	0957
0600	0348 B	3421 B	107 C	2723	14735	0820	02027	0894
0700	0331	34267	080 B	2729	14745	0908	02611	0839
0800	0316	34321	069 B	2735	14756	0990	03245	0791
1000	0286	34398	053 B	2744	14777	1142	04647	0713
1200	0259	34451	060 B	2751	14800	1281	06213	0657
1500	0229	34514	089 B	2758	14839	1471	08840	0592
2000	0195	34587	138 B	2767	14909	1754	13890	0520
2500	0173	34632	210	2772	14986	2008	19762	0477
3000	0159	34660	250	2775	15067	2245	26505	0454
3500	0153	34671	301	2777	15152	2477	34311	0453





## SECTION IV

Bathythermograms



C.C.G.S. "ST. CATHARINES"

Daily bathythermograms

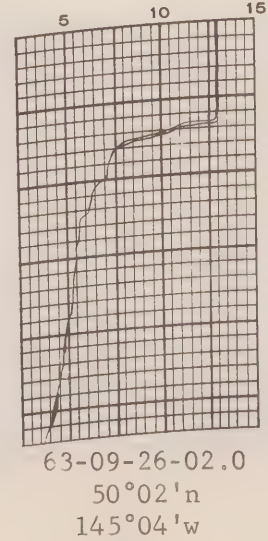
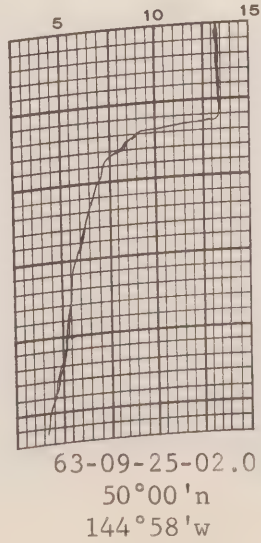
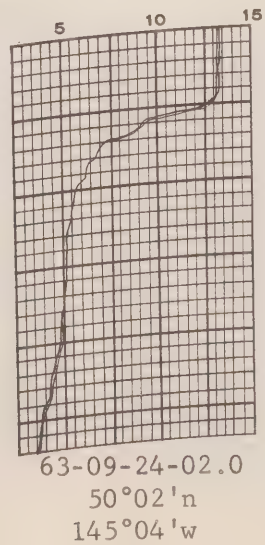
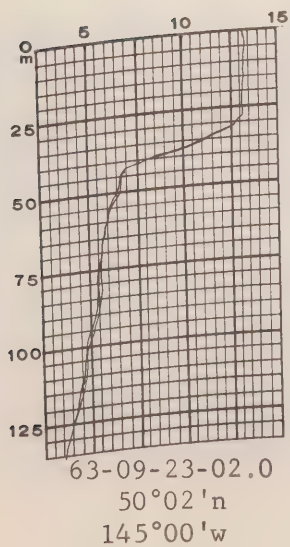
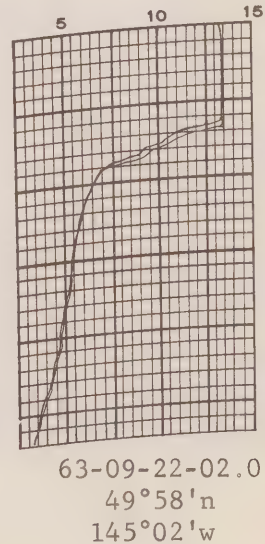
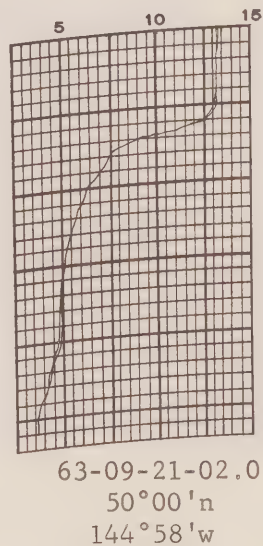
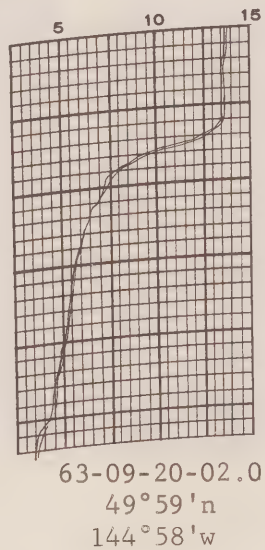
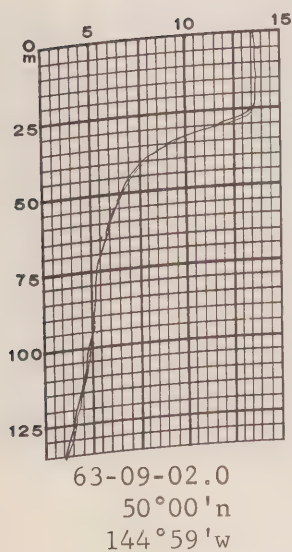
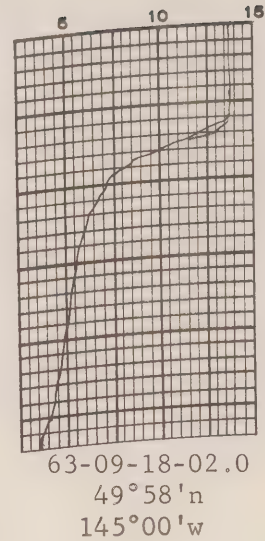
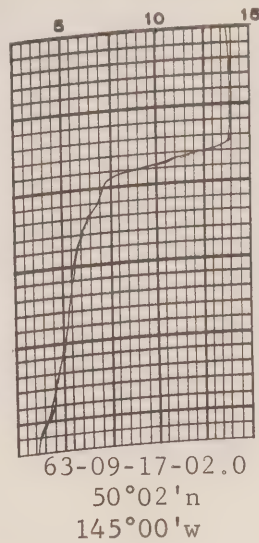
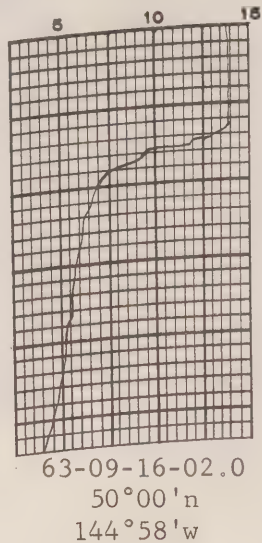
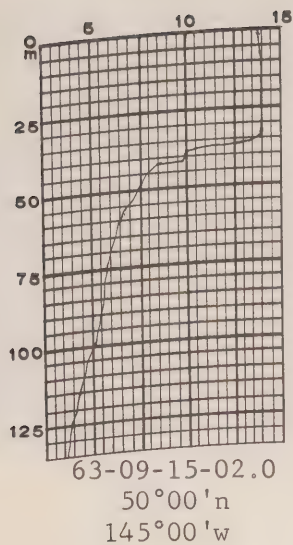
and

OCEAN series bathythermograms

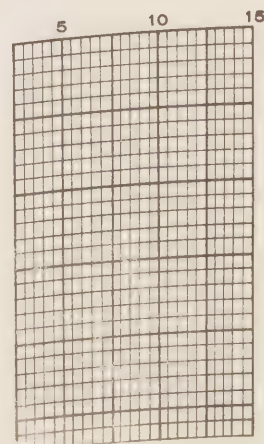
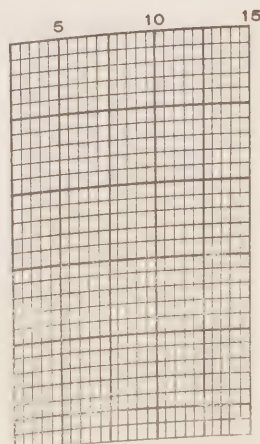
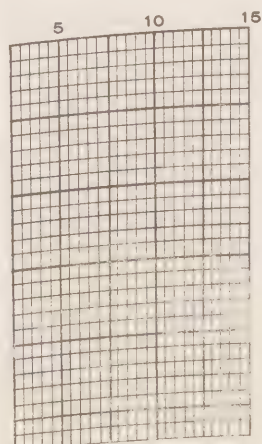
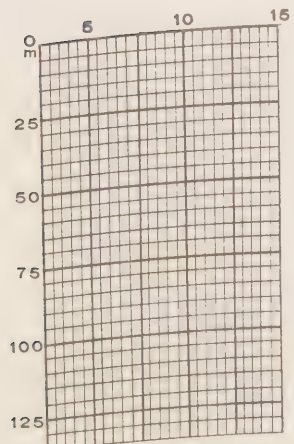
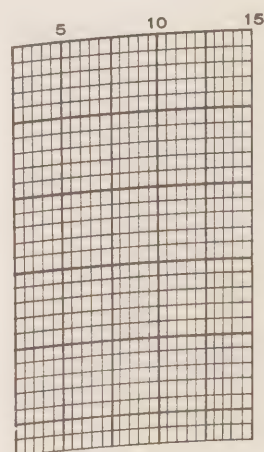
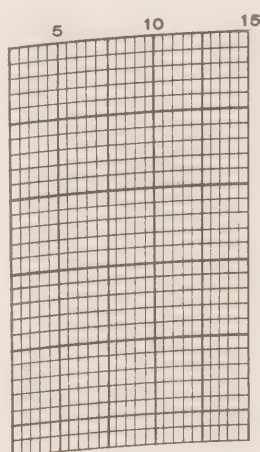
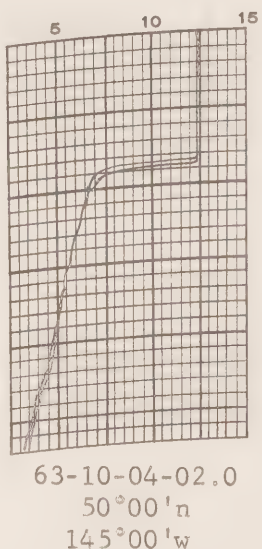
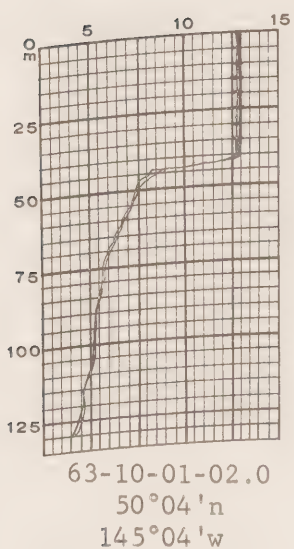
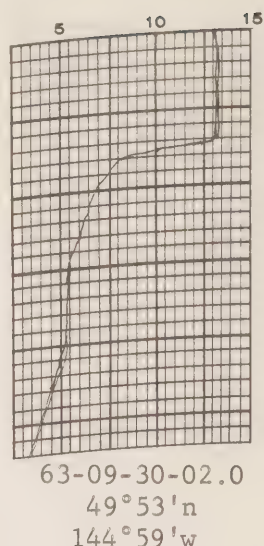
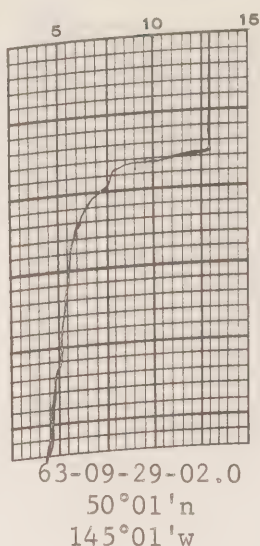
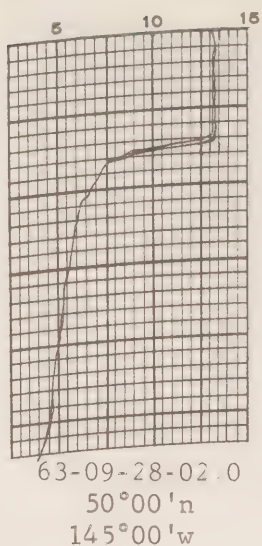
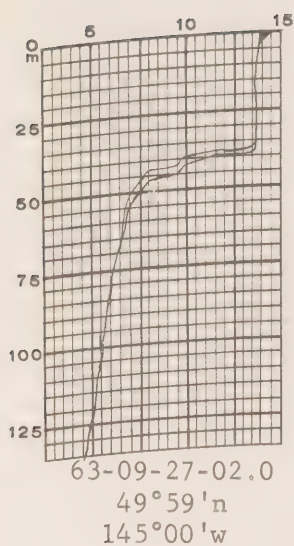




## C.C.G.S. "St. Catharines", Survey P-63-4

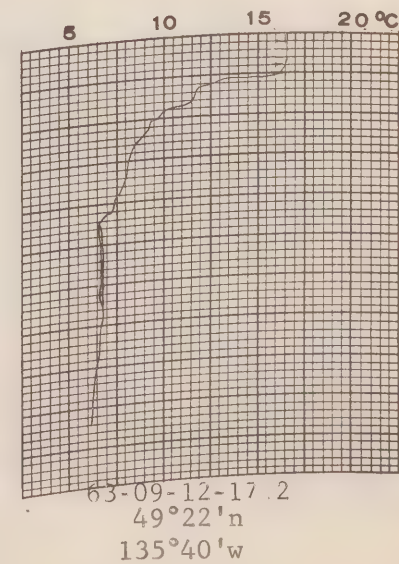
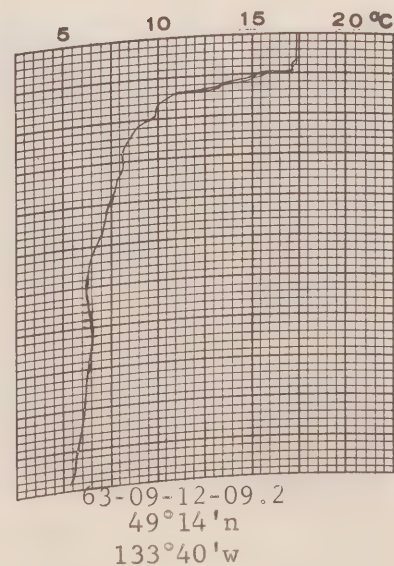
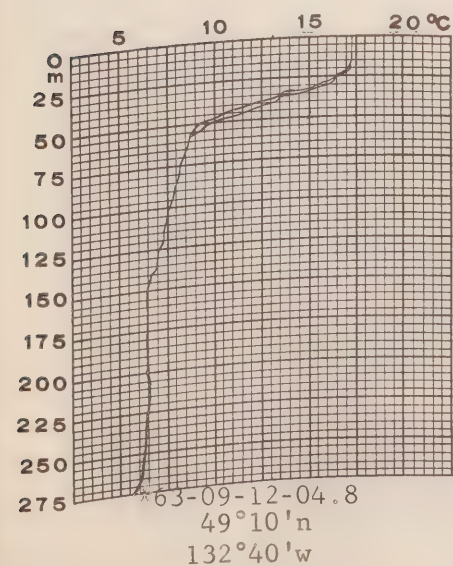
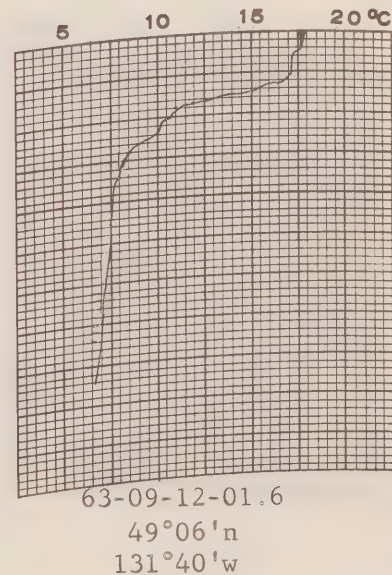
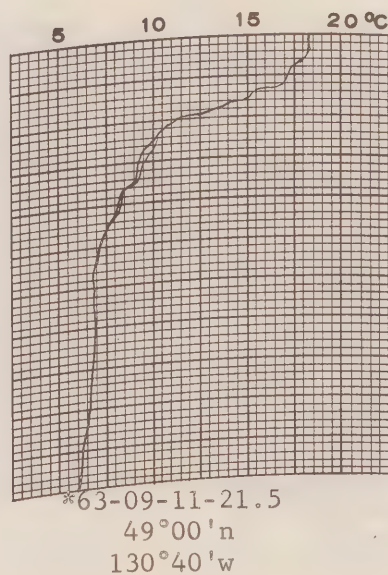
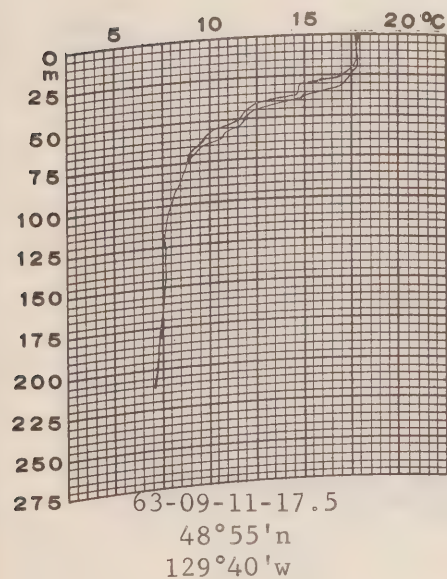
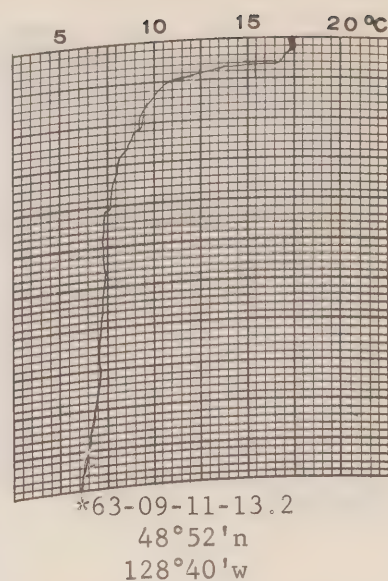
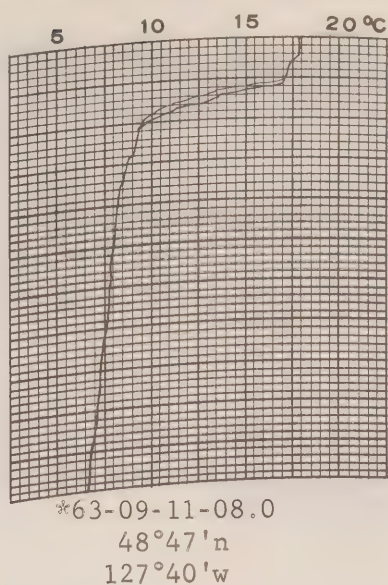
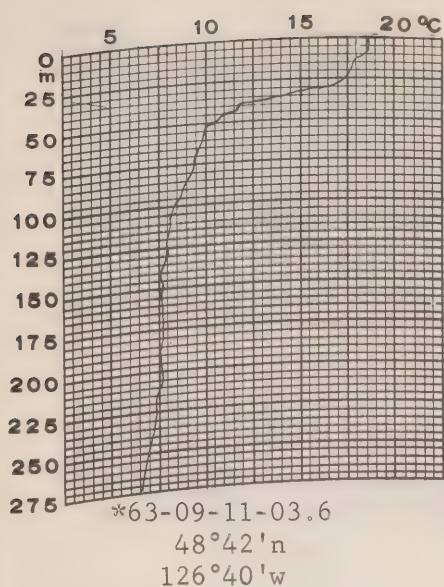


## C.C.G.S. "St. Catharines". Survey P-63-4



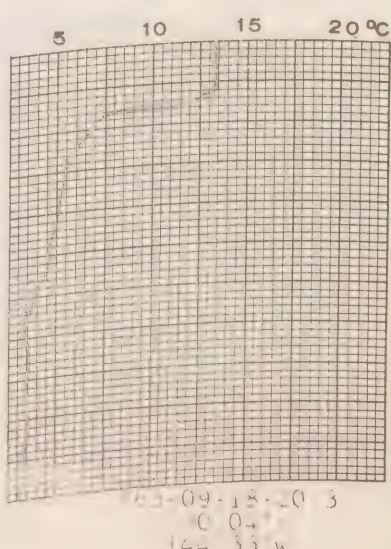
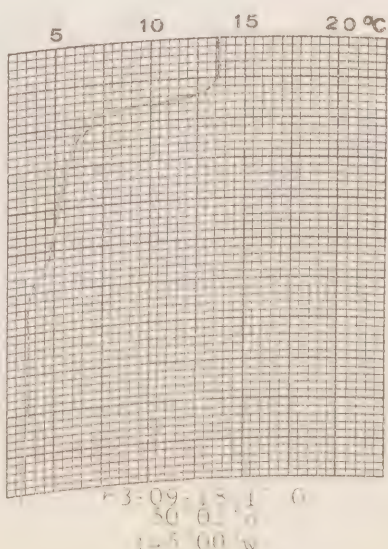
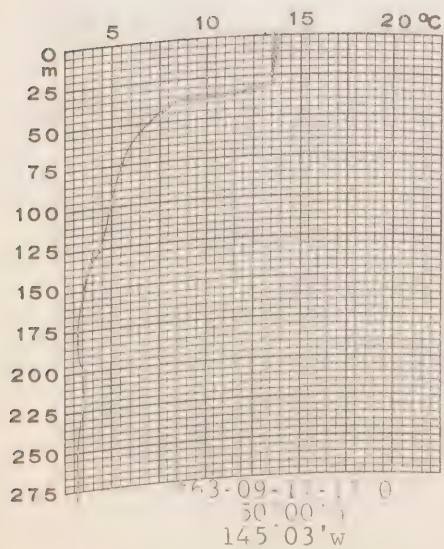
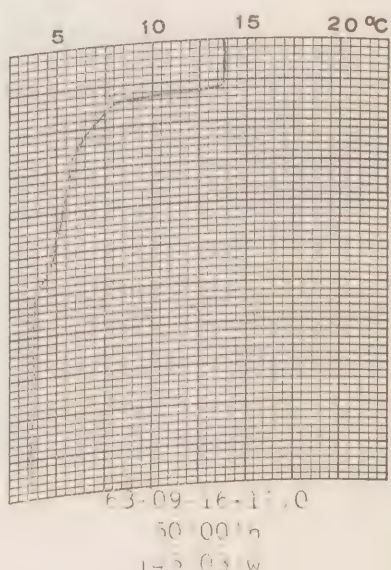
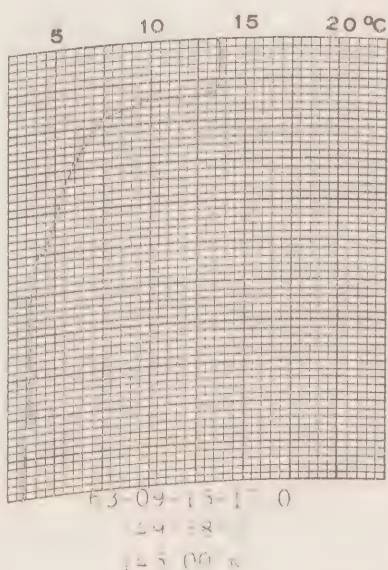
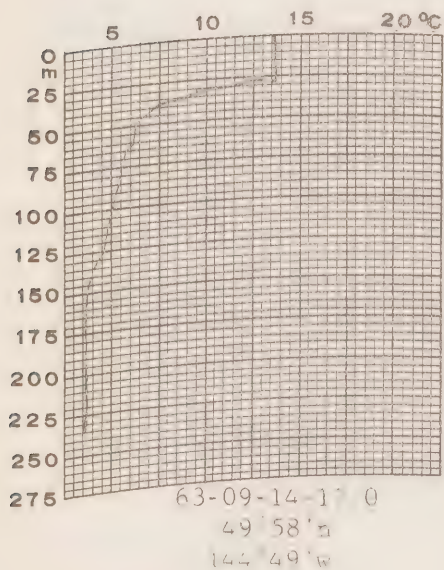
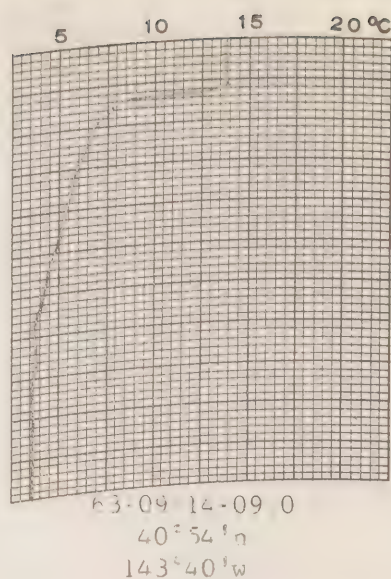
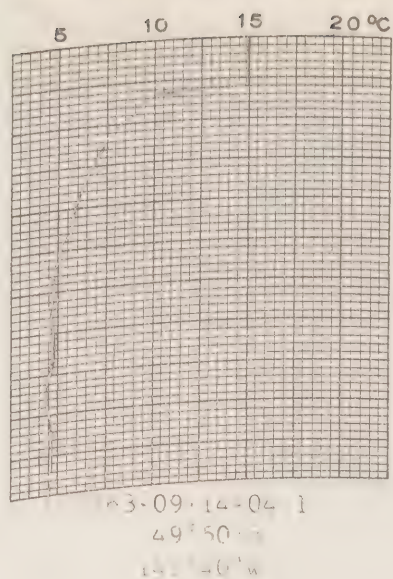
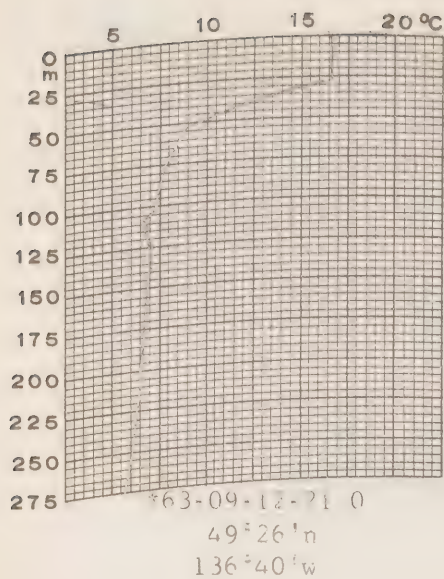


## C.C.G.S. "St. Catharines", Survey P-63-4



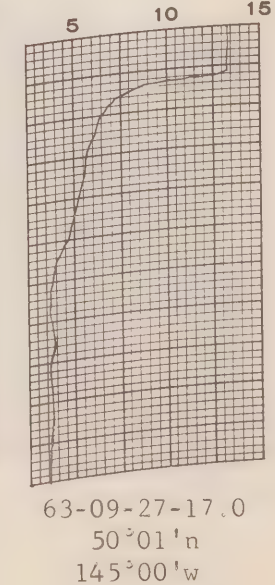
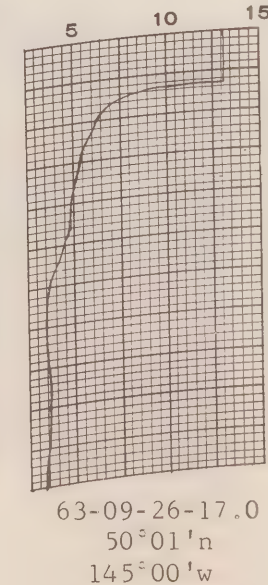
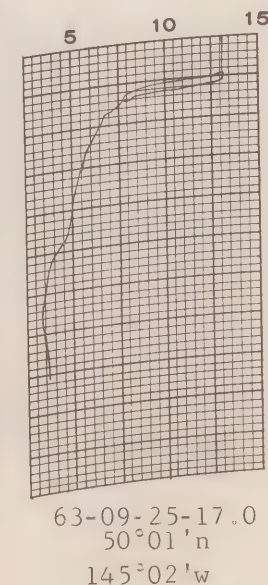
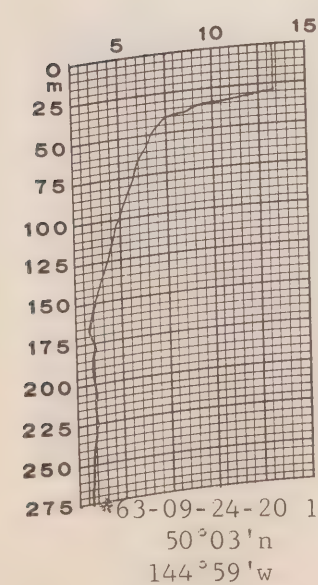
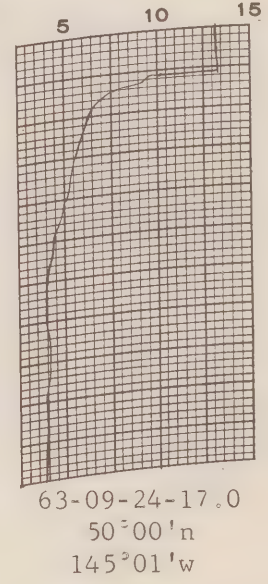
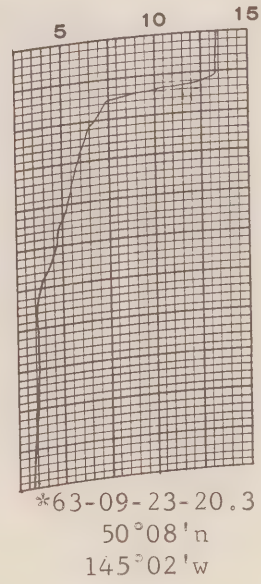
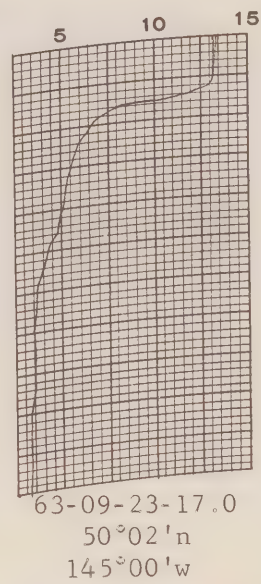
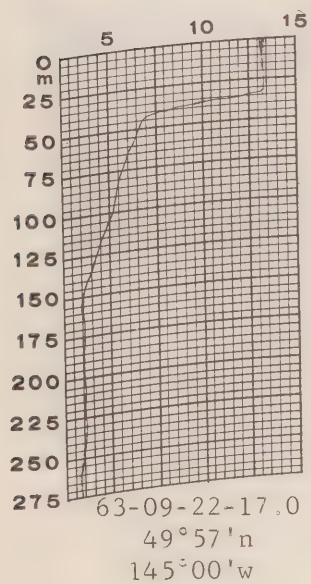
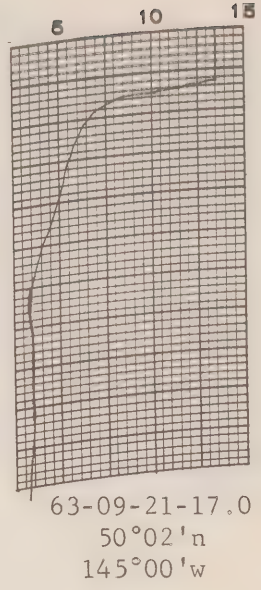
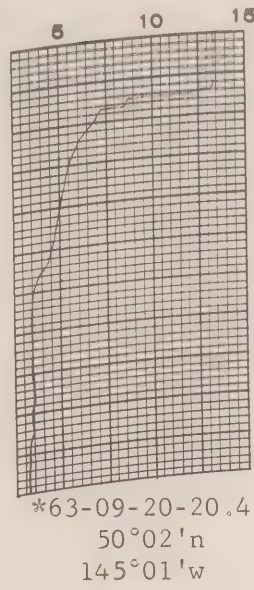
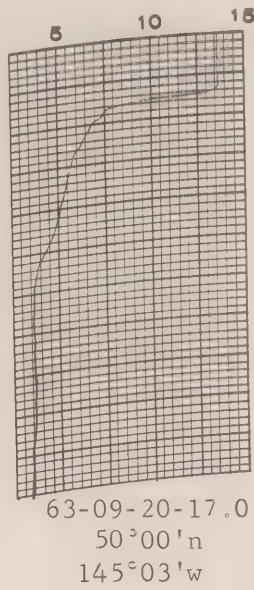
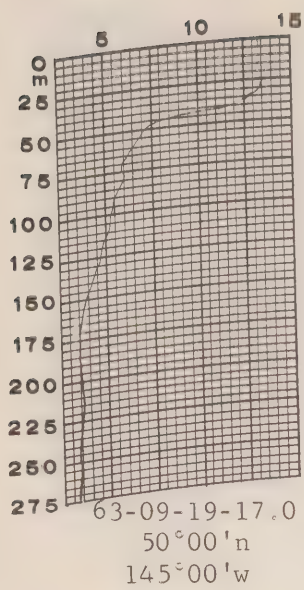


C C G 3 "St Catharines" Survey 1963



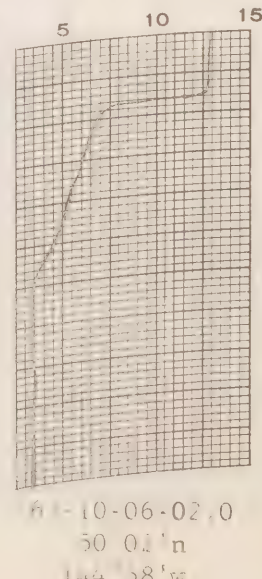
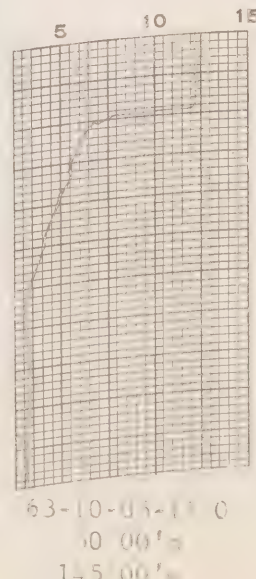
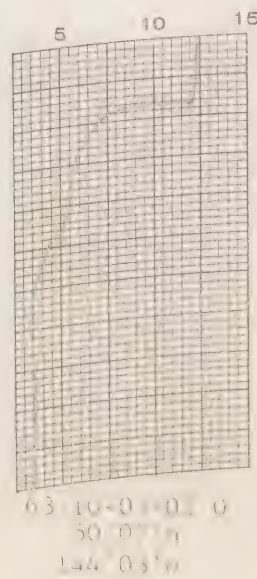
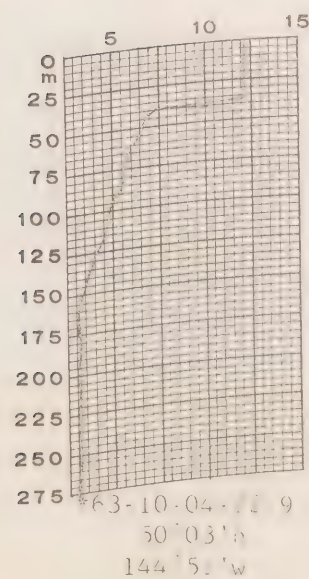
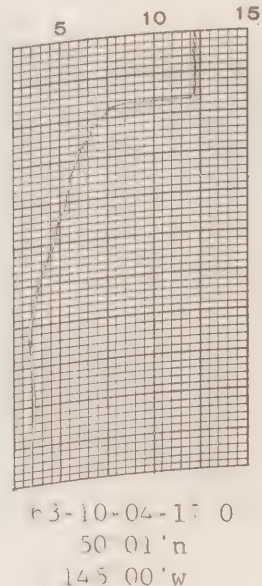
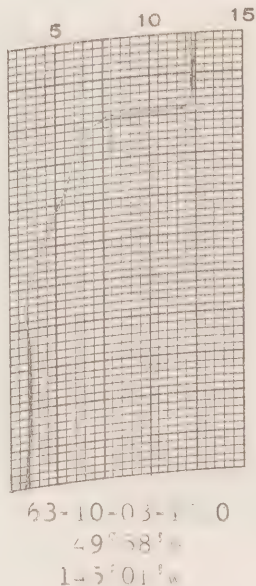
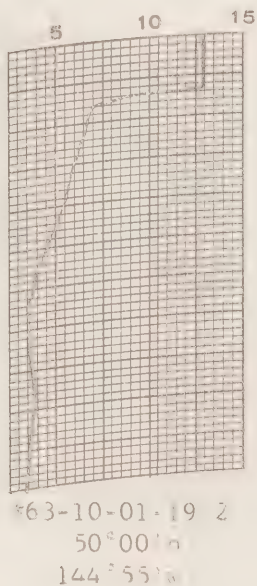
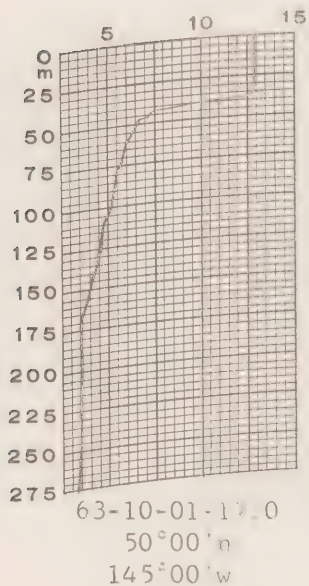
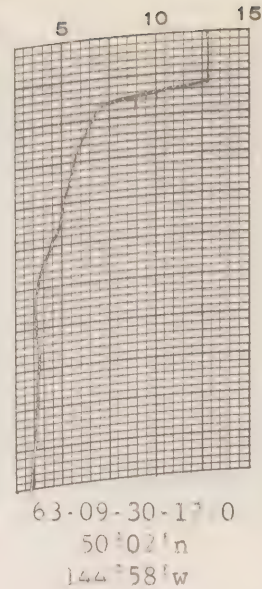
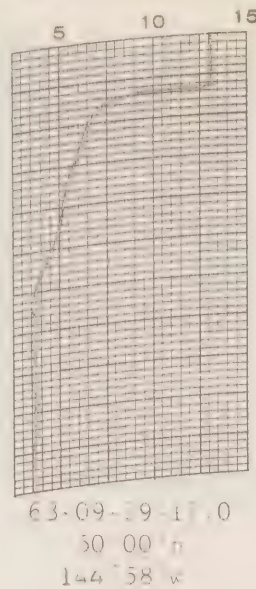
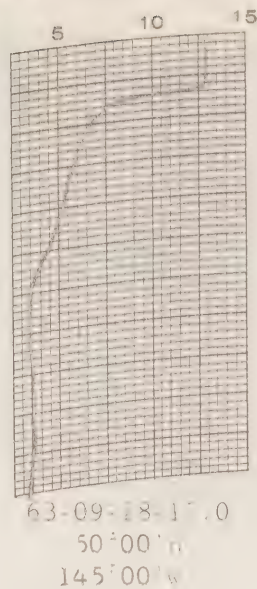
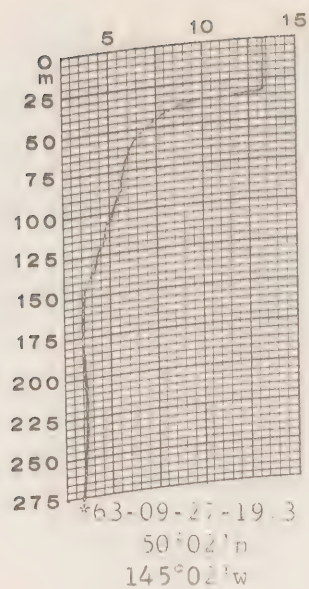


## C.C.G.S. "St. Catharines". Survey P-63-4



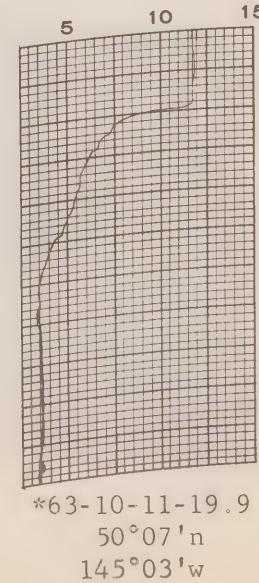
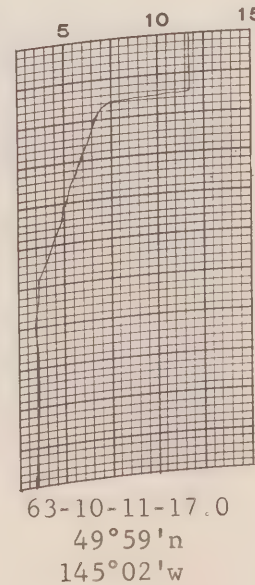
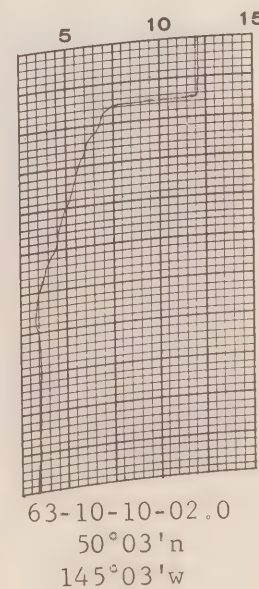
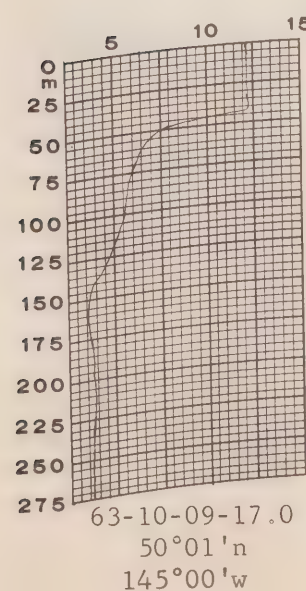
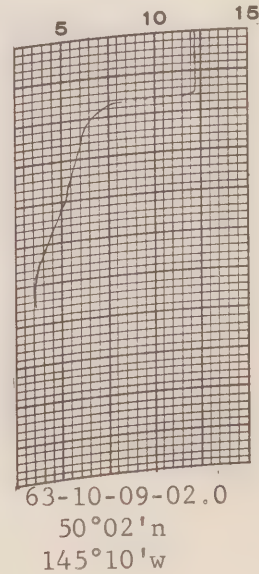
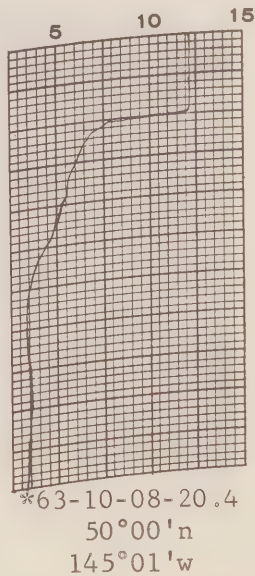
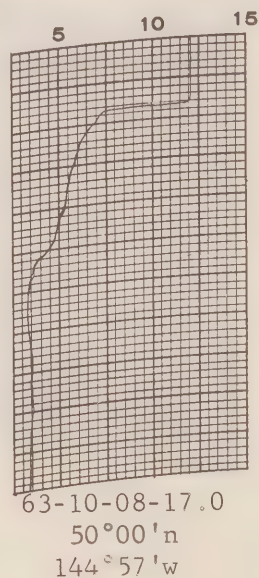
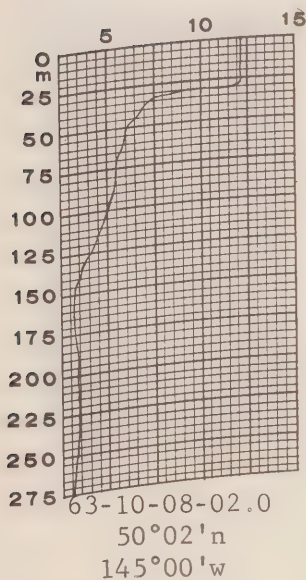
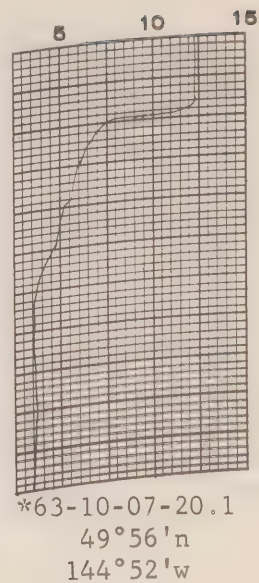
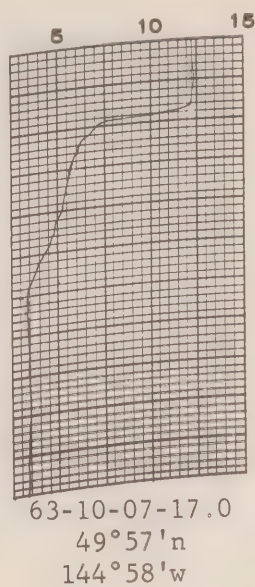
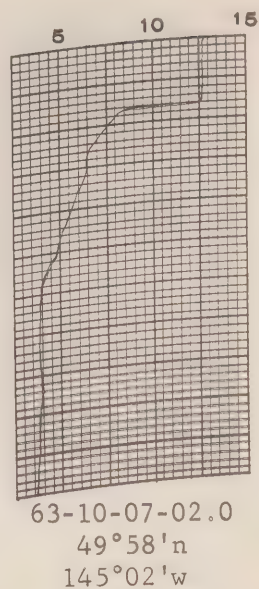
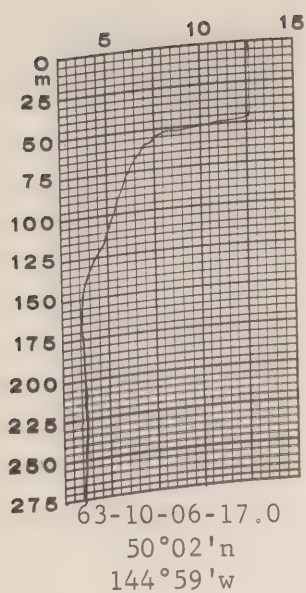


## C O G S, "St Catharines" Survey P-63-4



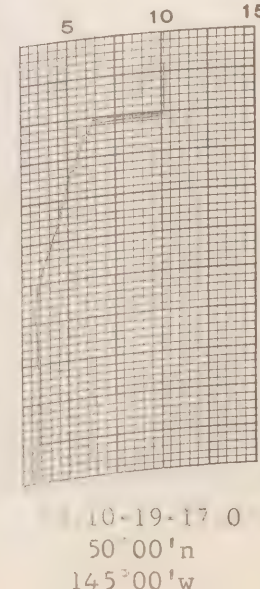
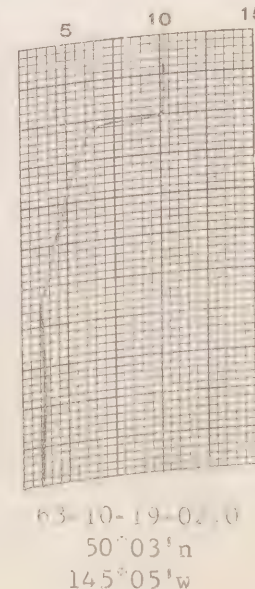
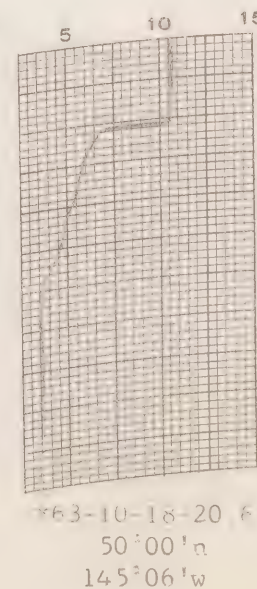
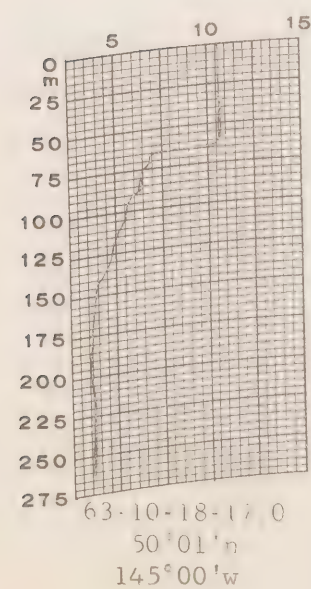
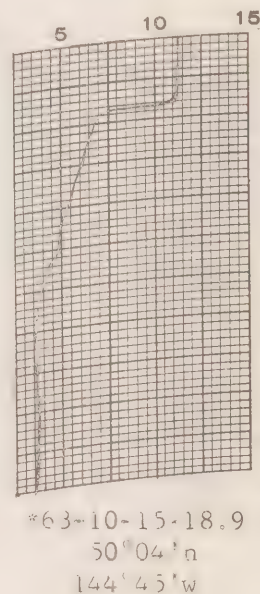
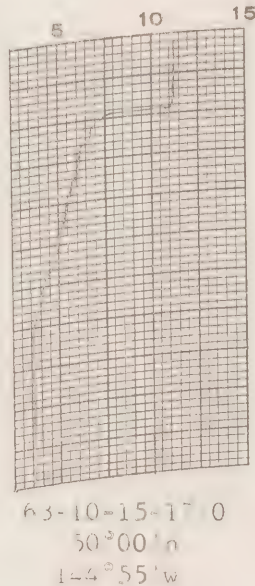
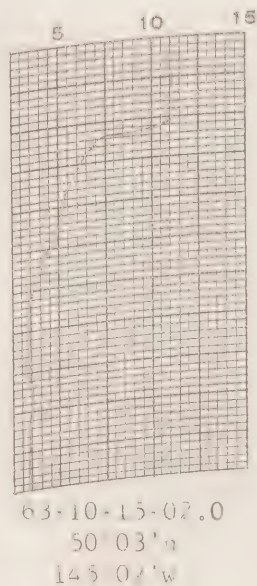
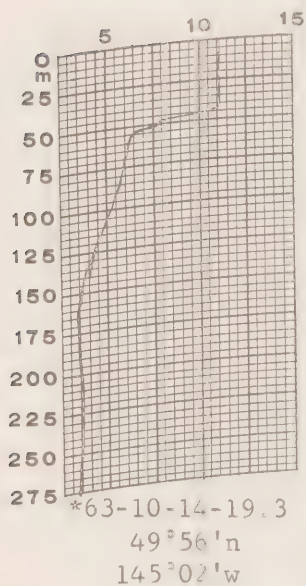
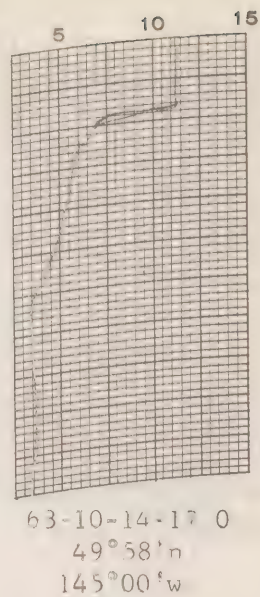
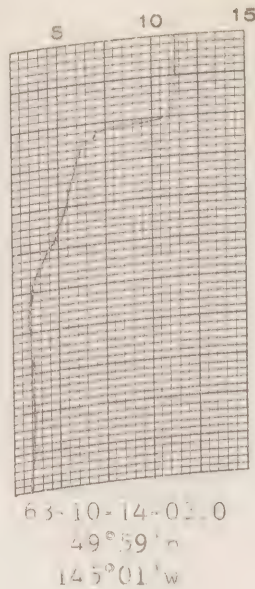
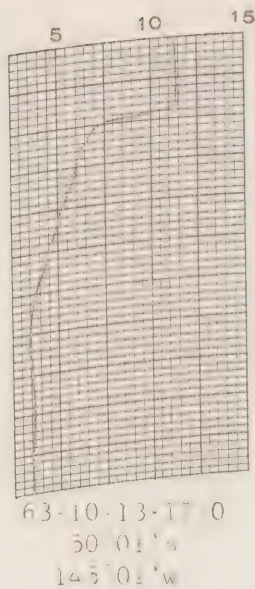
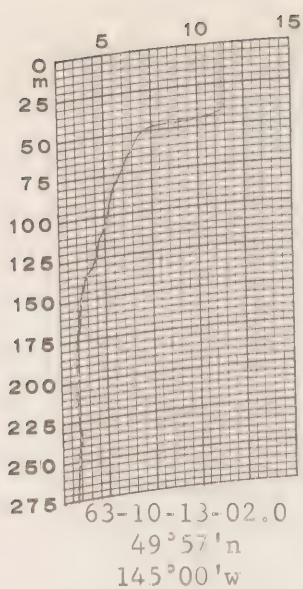


## C.C.G.S. "St. Catharines", Survey P-63-4



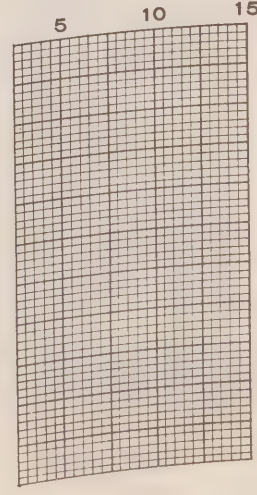
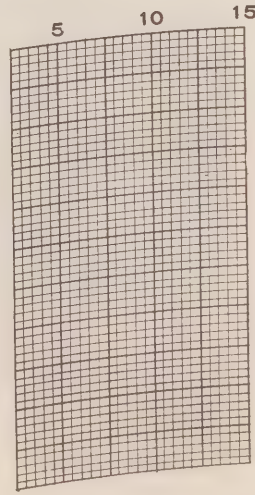
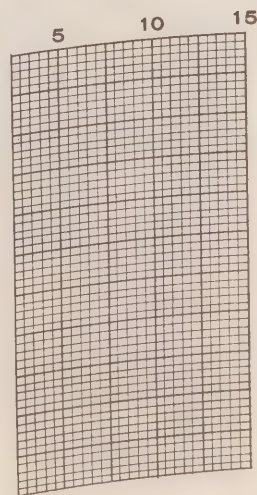
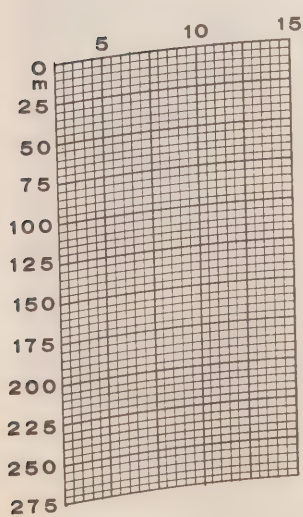
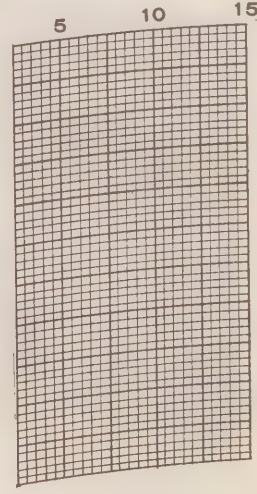
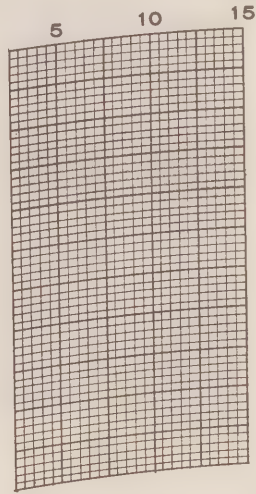
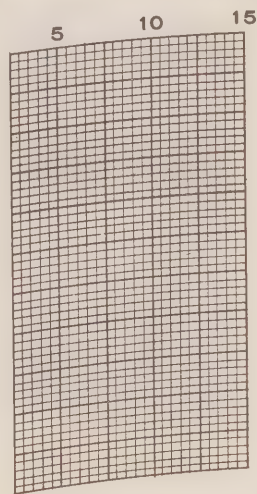
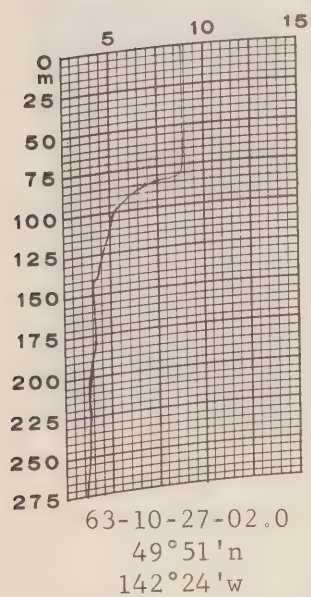
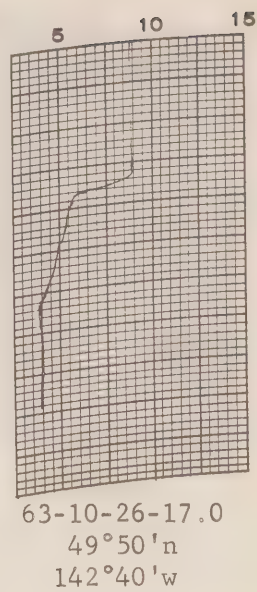
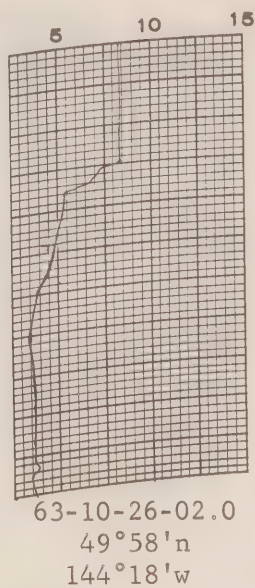
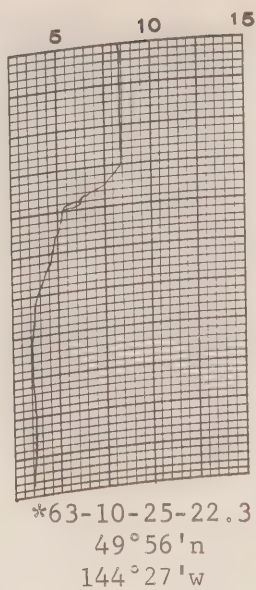
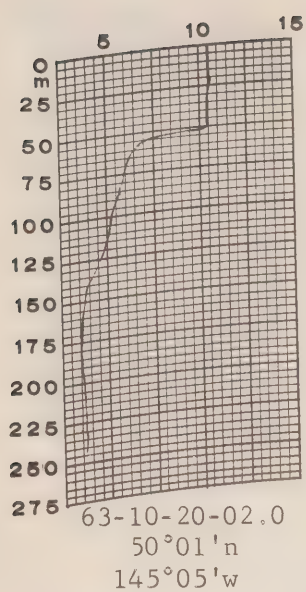


## C. C. G. S. "St. Catharines" Survey P-63-4

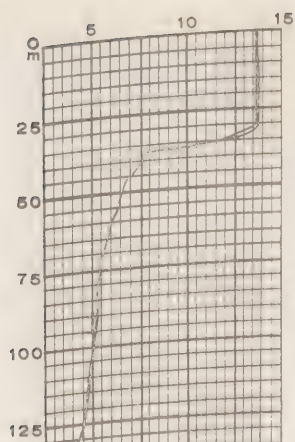




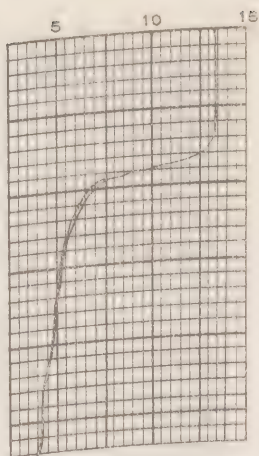
## C.C.G.S. "St. Catharines", Survey P-63-4



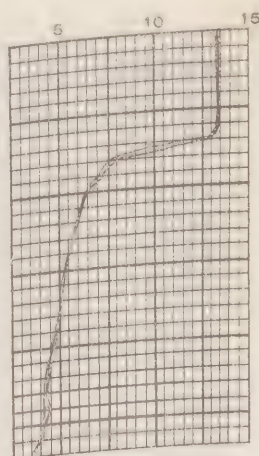
C.C.G.S. "St. Catharines" Survey P-63-4, OCEAN Series



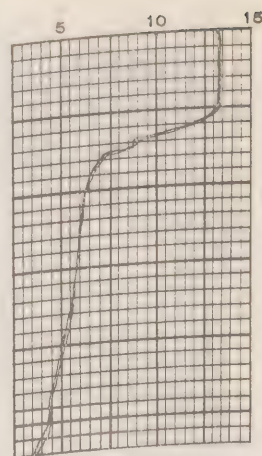
63-09-16-18.2  
50°03'n  
144°57'w



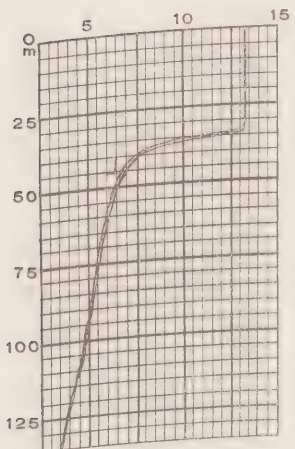
63-09-18-18.5  
50°01'n  
144°56'w



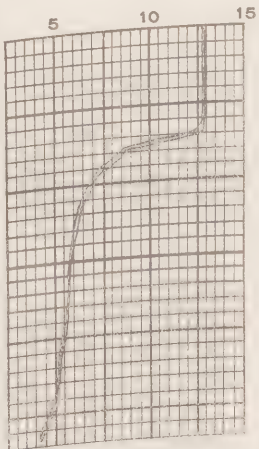
63-09-20-18.5  
50°03'n  
145°02'w



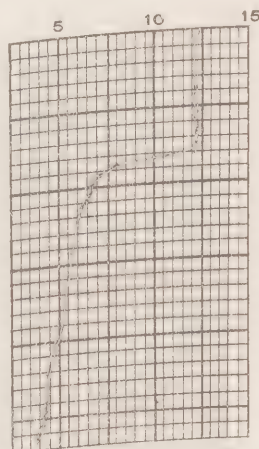
63-09-23-18.7  
50°07'n  
145°01'w



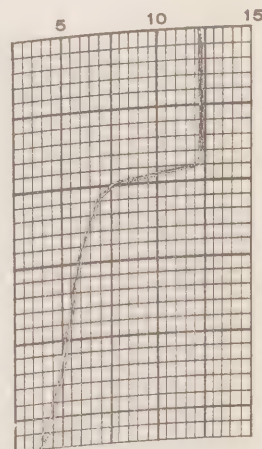
63-09-27-18.7  
50°02'n  
145°03'w



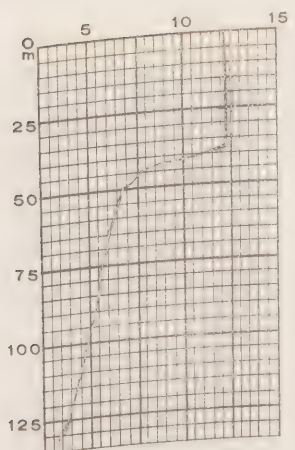
63-09-30-18.8  
50°05'n  
144°53'w



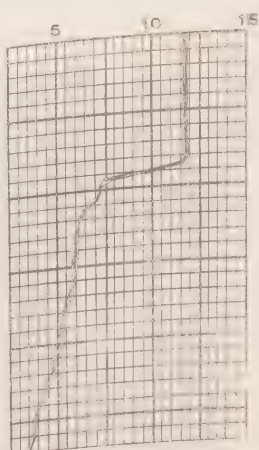
63-10-04-18.7  
50°01'n  
145°00'w



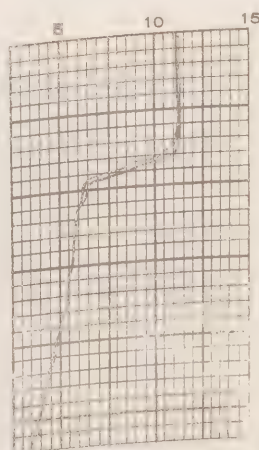
63-10-07-18.5  
49°59'n  
144°58'w



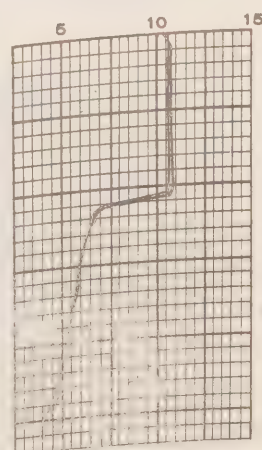
63-10-09-18.3  
49°59'n  
144°59'w



63-10-11-19.0  
50°01'n  
145°03'w



63-10-14-18.3  
49°57'n  
145°01'w



63-10-18-18.7  
50°01'n  
145°06'w



C.C.G.S. "STONETOWN" Patrol No. 58

Daily bathythermograms

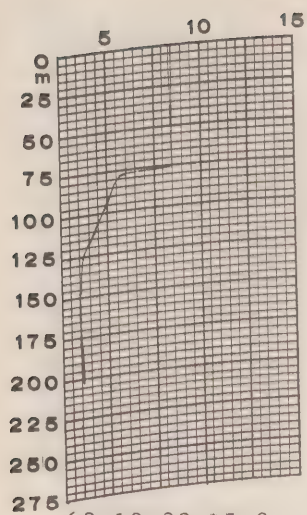
and

OCEAN series bathythermograms

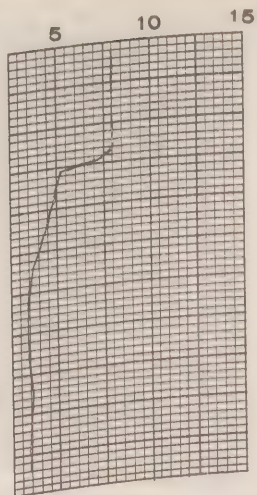




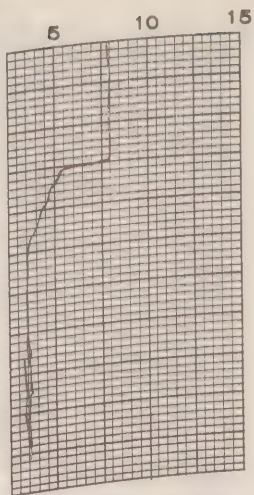
## C.C.G.S. "Stonetown" Patrol No. 58



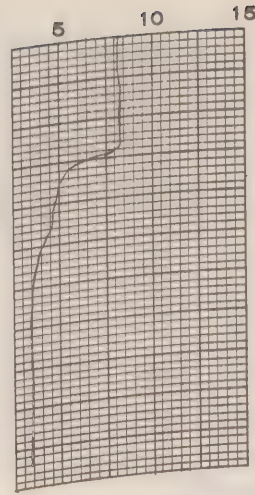
63-10-28-17.0  
50°06'N  
144°56'W



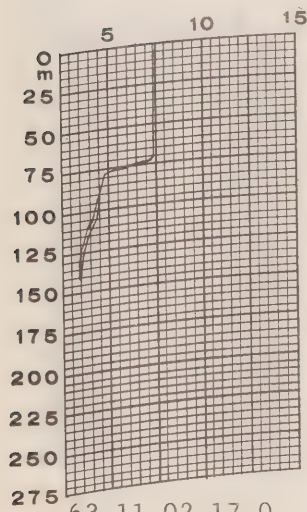
63-10-29-02.0  
50°06'N  
145°18'W



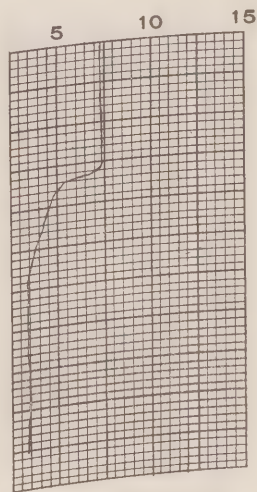
63-10-29-17.0  
50°06'N  
145°12'W



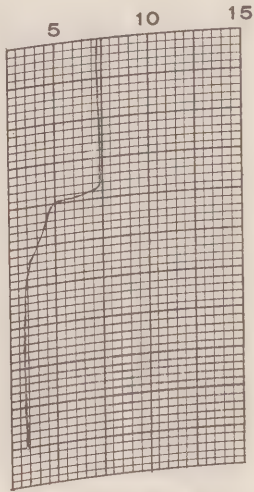
63-10-30-02.0  
50°06'N  
144°54'W



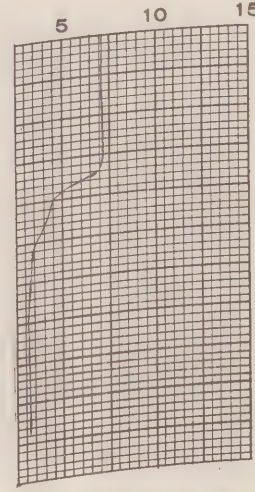
63-11-02-17.0  
50°06'N  
145°18'W



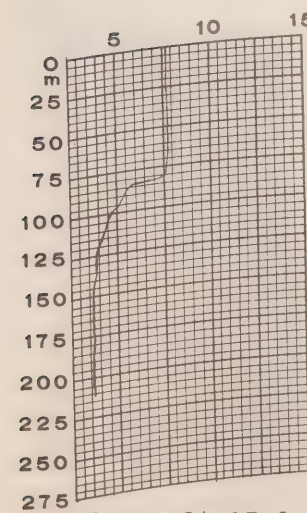
63-11-03-02.0  
49°54'N  
145°00'W



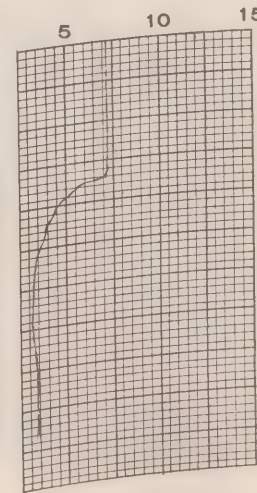
63-11-03-17.0  
50°12'N  
145°30'W



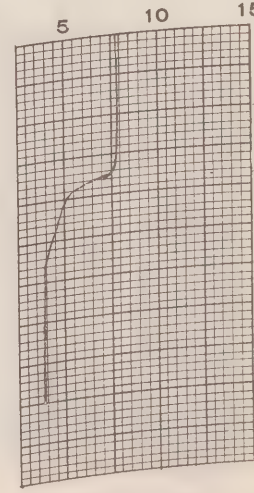
63-11-04-02.0  
50°00'N  
145°06'W



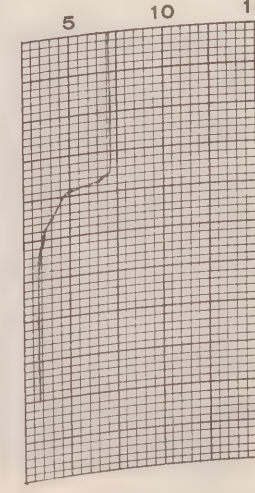
63-11-04-17.0  
50°00'N  
144°54'W



63-11-05-02.0  
50°00'N  
145°00'W



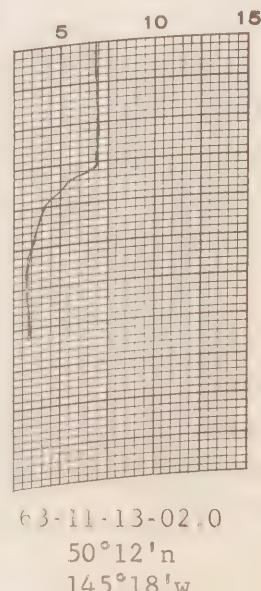
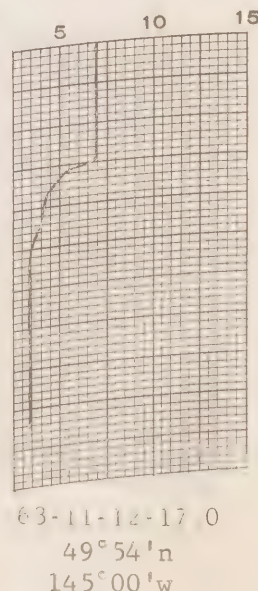
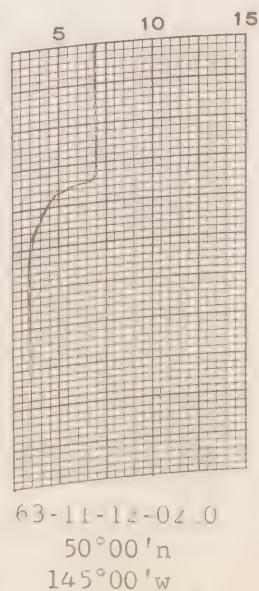
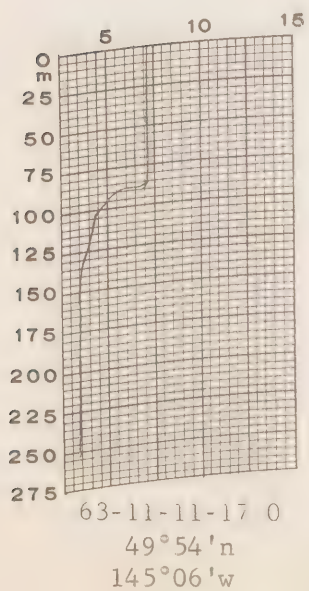
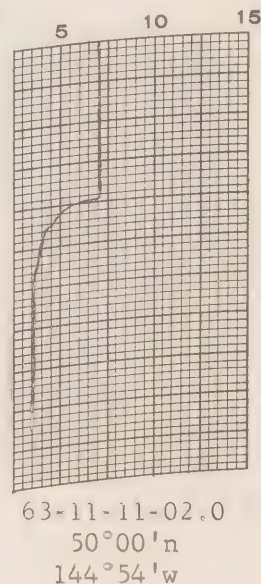
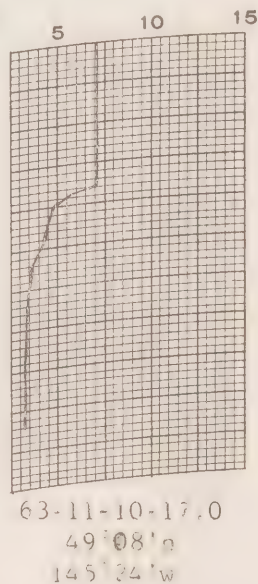
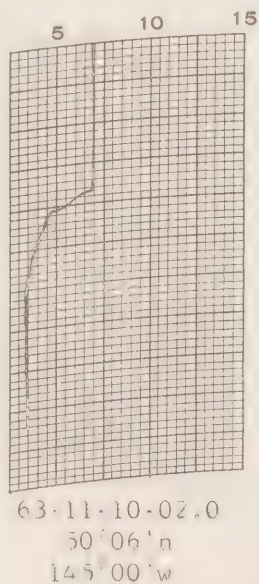
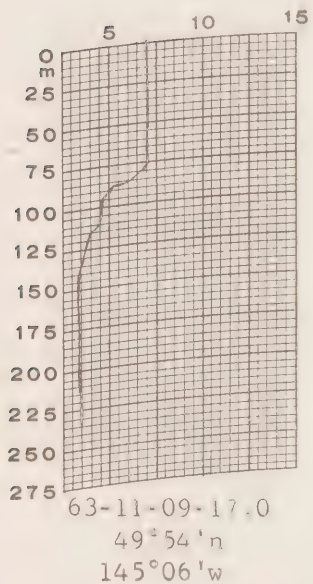
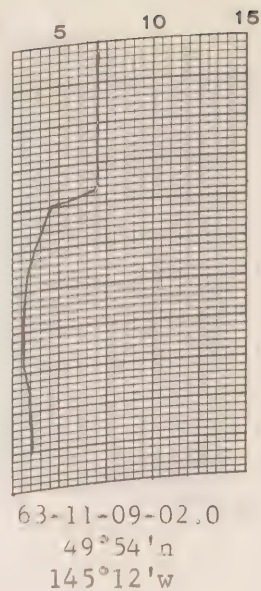
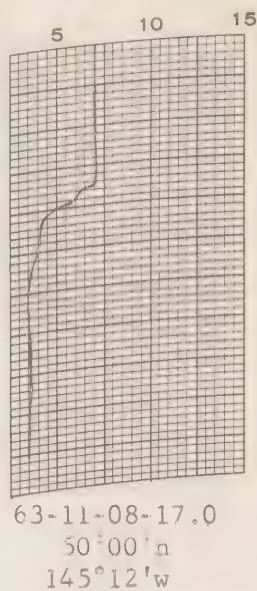
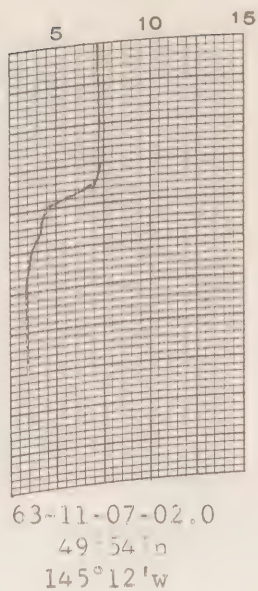
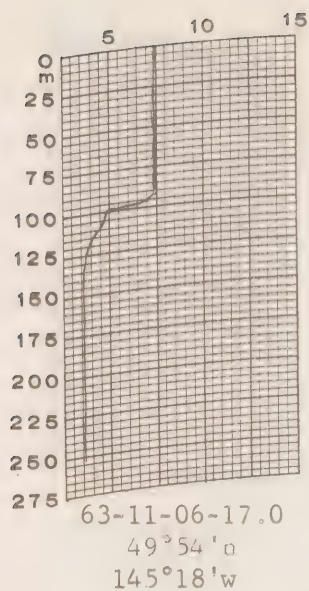
63-11-05-17.0  
49°54'N  
144°54'W



63-11-06-02.0  
50°00'N  
145°00'W

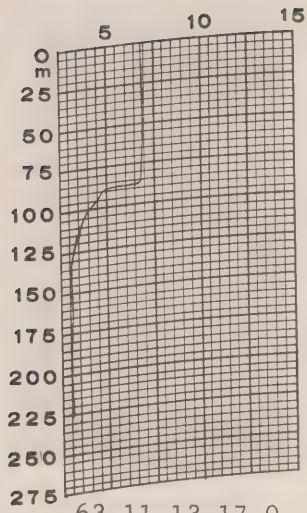


## C.C.G.S. "Stonetown", Patrol No. 58

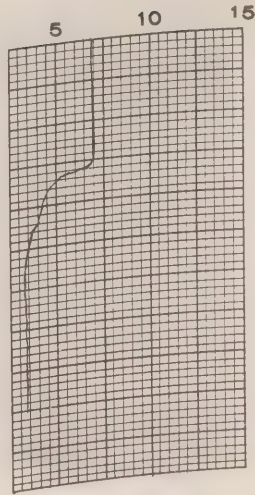




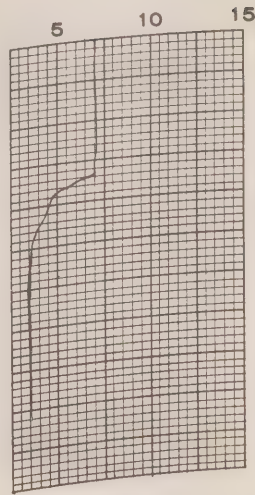
## C.C.G.S. "Stonetown", Patrol No. 58



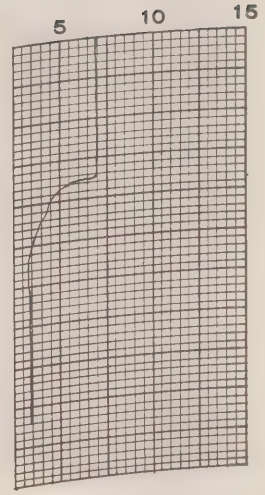
63-11-13-17.0  
50°18'n  
144°48'w



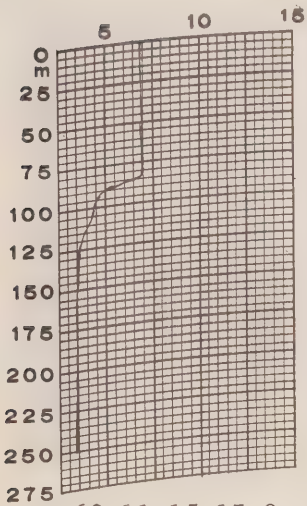
63-11-14-02.0  
50°12'n  
144°48'w



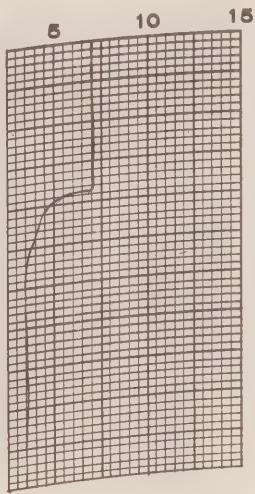
63-11-14-17.0  
49°54'n  
144°54'w



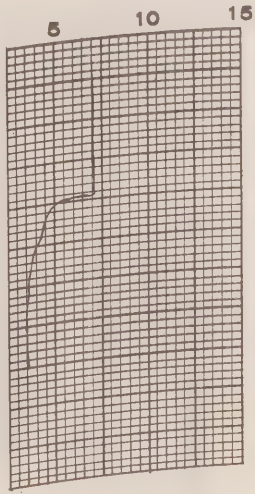
63-11-15-02.0  
49°48'n  
144°42'w



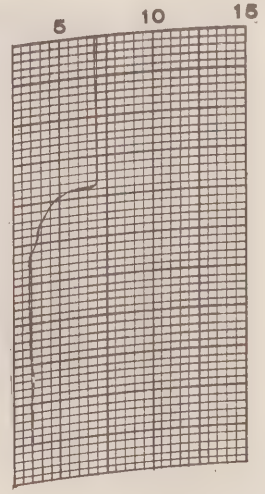
63-11-15-17.0  
49°54'n  
144°54'w



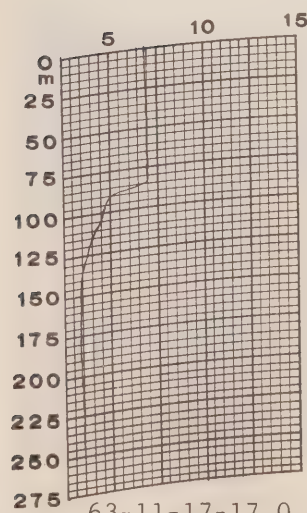
63-11-16-02.0  
50°06'n  
145°12'w



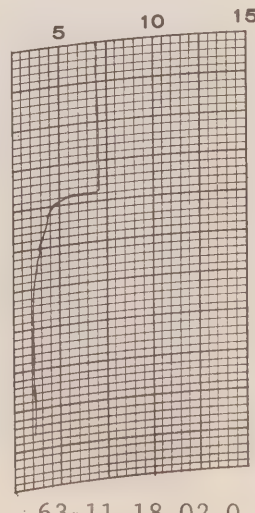
63-11-16-17.0  
49°54'n  
144°48'w



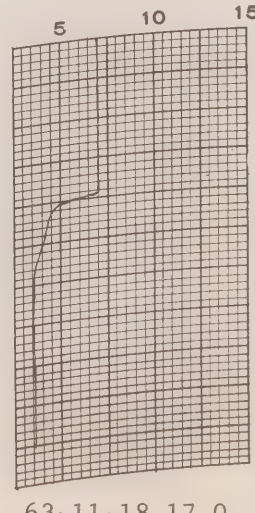
63-11-17-02.0  
50°12'n  
145°00'w



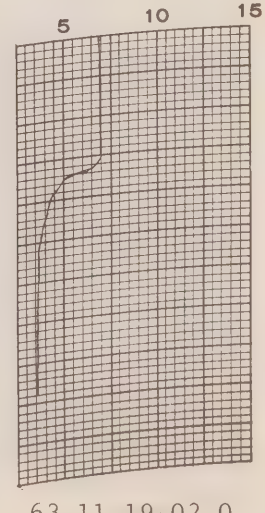
63-11-17-17.0  
49°54'n  
145°00'w



63-11-18-02.0  
50°12'n  
145°00'w



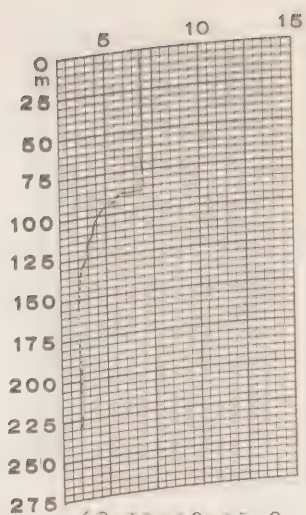
63-11-18-17.0  
50°18'n  
144°54'w



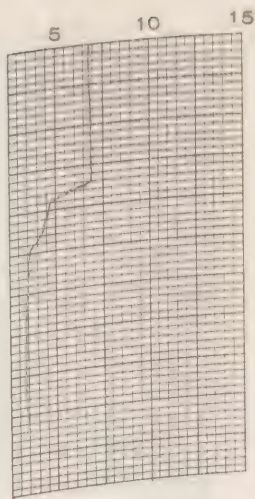
63-11-19-02.0  
50°00'n  
145°00'w



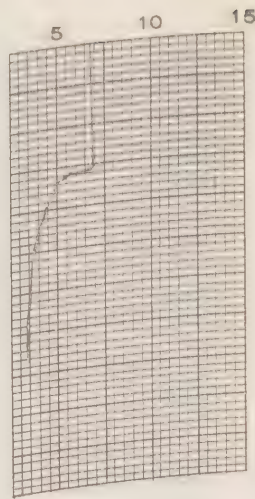
## C.C.G.S. "Stonetown" Patrol No. 58



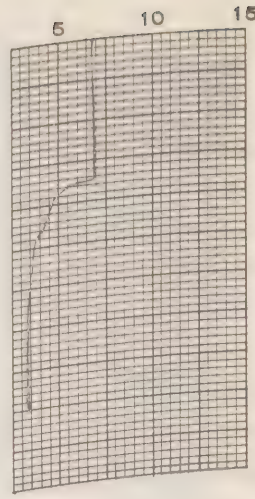
63-11-19-17.0  
49°54'n  
144°54'w



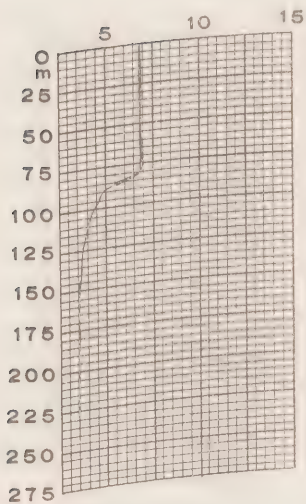
63-11-20-02.0  
49°54'n  
145°00'w



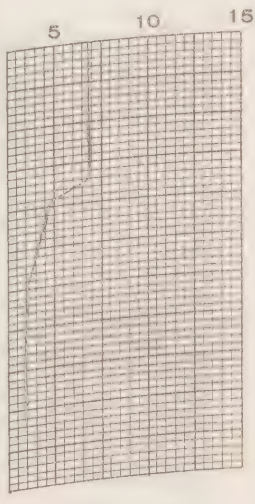
63-11-20-17.0  
49°42'n  
144°54'w



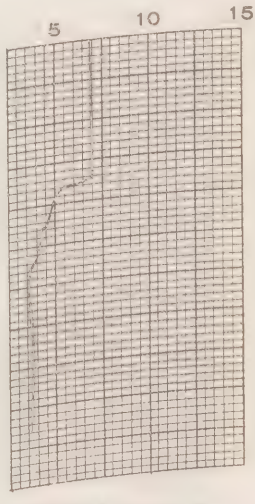
63-11-21-02.0  
49°54'n  
145°00'w



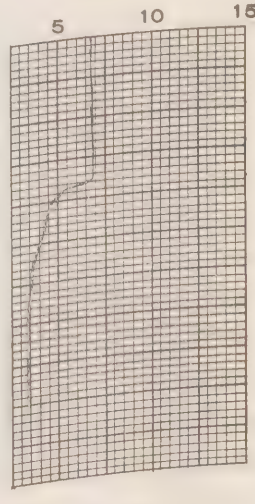
63-11-22-17.0  
49°42'n  
145°00'w



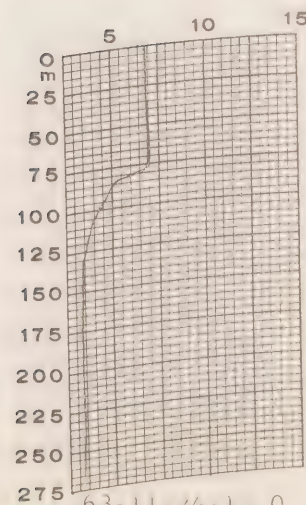
63-11-23-02.0  
49°48'n  
144°54'w



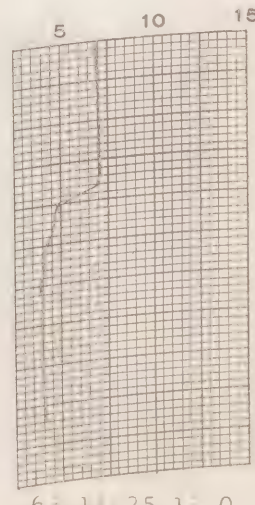
63-11-23-17.0  
50°18'n  
144°24'w



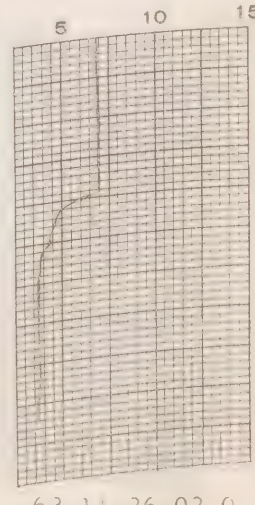
63-11-24-02.0  
49°54'n  
145°00'w



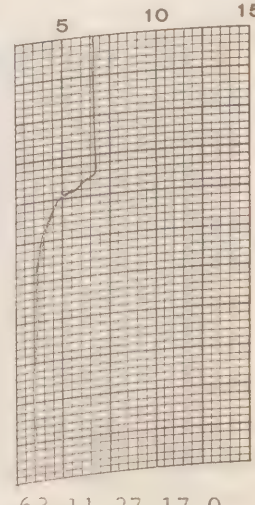
63-11-24-17.0  
49°54'n  
145°06'w



63-11-25-17.0  
49°30'n  
145°42'w



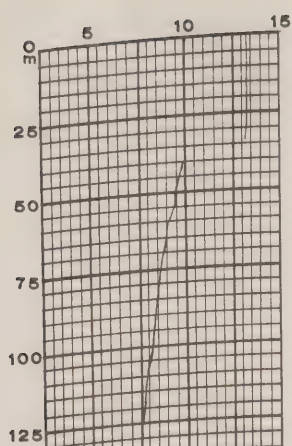
63-11-26-02.0  
49°42'n  
145°00'w



63-11-27-17.0  
49°54'n  
145°18'w



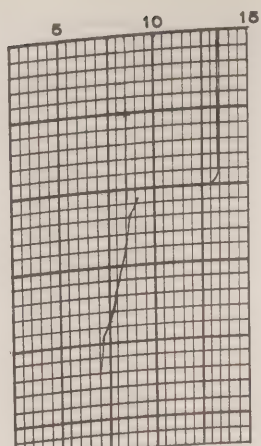
## C.C.G.S. "Stonetown", Patrol No. 58, OCEAN Series



63-10-23-03.3

48°40'N

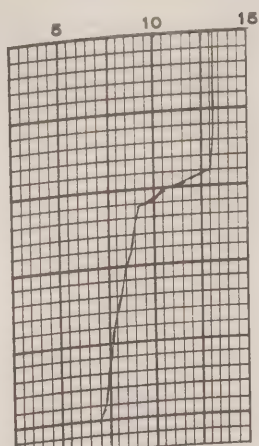
126°41'W



63-10-23-12.5

48°42'N

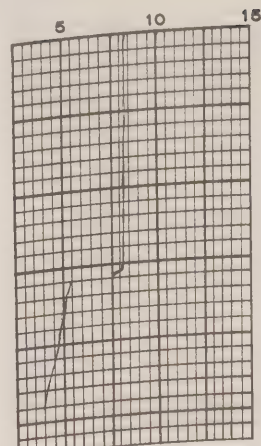
128°41'W



63-10-23-17.8

49°00'N

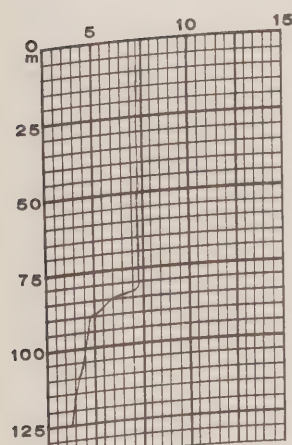
130°40'W



63-10-28-17.3

50°05'N

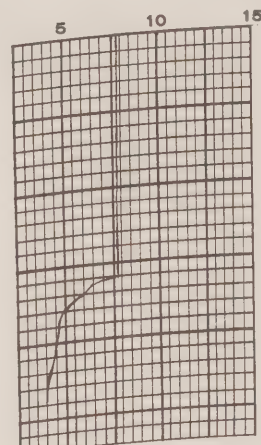
144°54'W



63-11-02-18.0

50°12'N

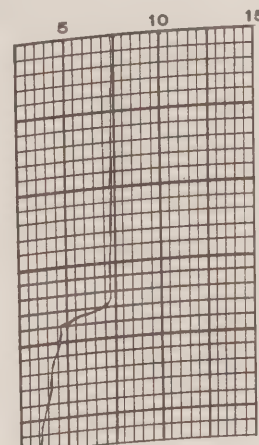
145°18'W



63-11-04-18.2

50°00'N

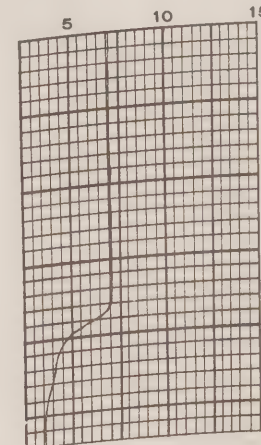
144°48'W



63-11-06-17.2

49°48'N

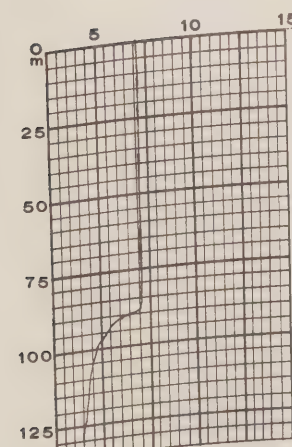
145°18'W



63-11-08-17.7

50°06'N

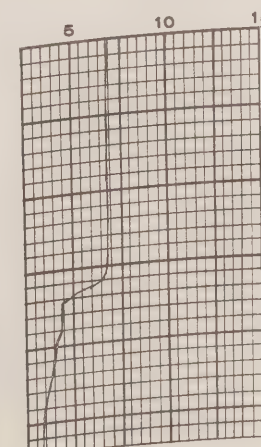
145°18'W



63-11-10-17.0

49°54'N

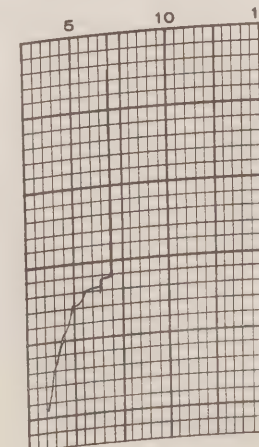
145°30'W



63-11-12-17.0

50°00'N

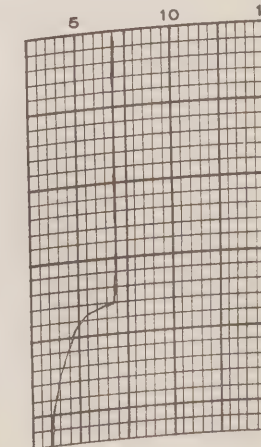
145°18'W



63-11-14-18.0

49°54'N

144°42'W

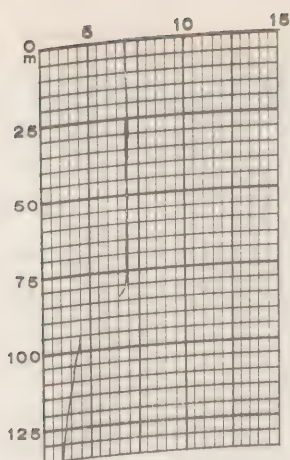


63-11-16-17.8

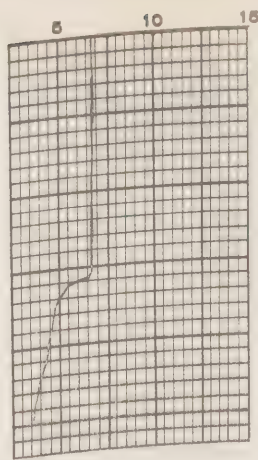
50°00'N

144°54'W

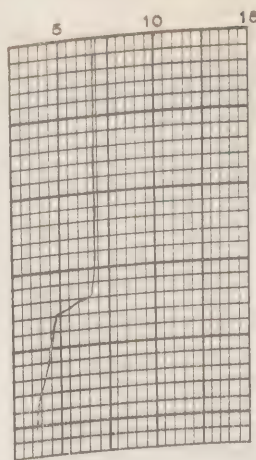
## C.C.G.S. "Stonetown", Patrol No. 58, OCEAN Series



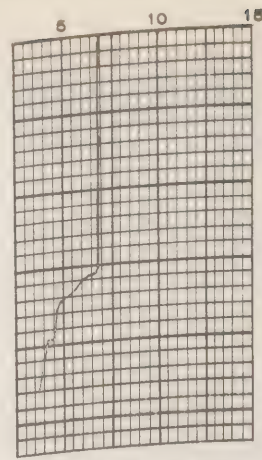
63-11-18-17.8  
50°24'n  
144°54'w



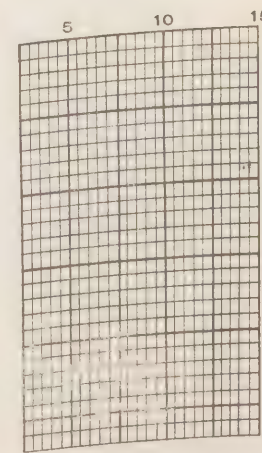
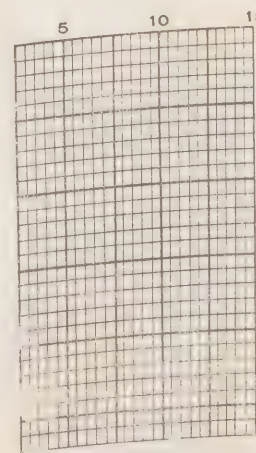
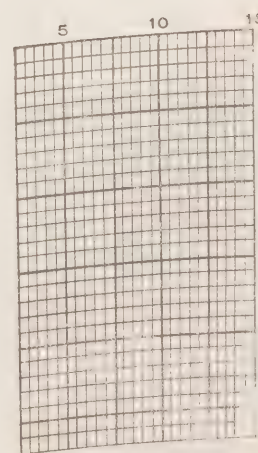
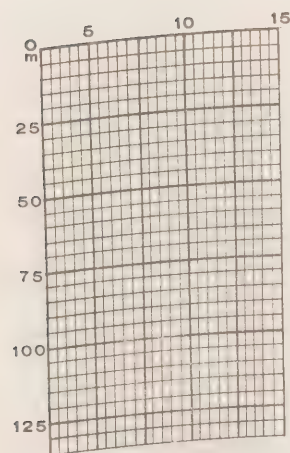
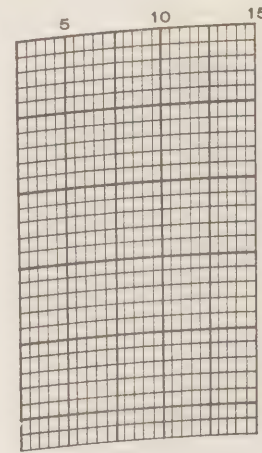
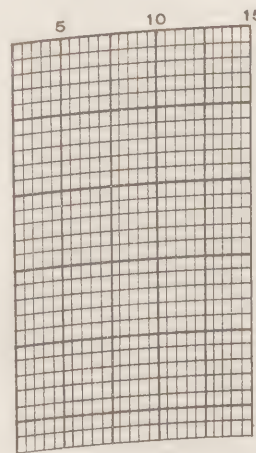
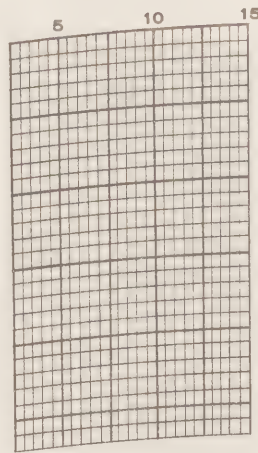
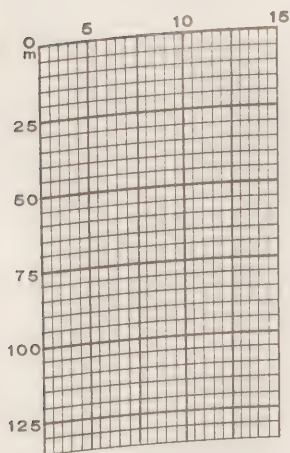
63-11-20-17.2  
49°48'n  
145°00'w



63-11-22-17.2  
49°36'n  
145°06'w



63-11-24-17.5  
49°48'n  
145°12'w



## SECTION V

Surface salinity data







## Surface salinity observations, Ocean Weather Station "P"

Date - Time	Position		Salinity ‰
C.C.G.S. "St. Catharines", Survey P-63-4			
63-09-11-17.5	48°55'n.	129°40'w.	32.062
12-01.6	49°06'	131°40'	32.377
12-09.2	49°14'	133°40'	32.412
12-17.2	49°22'	135°40'	32.244
15-02.0	50°00'	145°00'	32.443
16-02.0	50°00'	144°58'	32.445
17-02.0	50°02'	145°00'	32.450
18-02.0	49°58'	145°00'	32.466
19-02.0	50°00'	144°59'	32.417
20-02.0	49°59'	144°58'	32.476
21-02.0	50°00'	144°58'	32.507
22-02.0	49°58'	145°02'	32.460
23-02.0	50°02'	145°00'	32.472
24-02.0	50°02'	145°04'	32.465
25-02.0	50°00'	144°58'	32.434
26-02.0	50°02'	145°04'	32.476
27-02.0	49°59'	145°00'	32.465
28-02.0	50°00'	145°00'	32.465
29-02.0	50°01'	145°01'	32.547
30-02.0	49°53'	144°59'	32.471
63-10-01-02.0	50°04'	145°04'	32.458
04-02.0	50°04'	145°00'	32.463
05-02.0	50°07'	145°03'	32.470
06-02.0	50°02'	144°58'	32.514
07-02.0	49°58'	145°02'	32.451
08-02.0	50°02'	145°00'	32.448
09-02.0	50°02'	145°10'	32.516
10-02.0	50°03'	145°03'	32.490
13-02.0	49°57'	145°00'	32.578
14-02.0	49°59'	145°01'	32.497
15-02.0	50°03'	145°02'	32.567
18-02.0	50°00'	144°56'	32.567
19-02.0	50°03'	145°05'	32.517
20-02.0	50°01'	145°05'	32.577
27-02.0	49°51'	142°24'	32.490
C.C.G.S. "Stonetown", Patrol No. 58			
63-10-29-02.0	50°06'n.	145°18'w.	32.696
30-02.0	50°06'	144°54'	32.670
63-11-03-02.0	49°54'	145°00'	32.679
04-02.0	50°00'	145°06'	32.665

## Surface salinity observations, Ocean Weather Station "P"

Date - Time	Position		Salinity ‰
C.C.G.S. "Stonetown", Patrol No. 58			
63-11-05-02.0	50°00' n.	145°00' w.	32.658
06-02.0	50°00'	145°00'	32.624
07-02.0	49°54'	145°12'	32.680
09-02.0	49°54'	145°12'	32.676
10-02.0	50°06'	145°00'	32.580
11-02.0	50°00'	144°54'	32.718
12-02.0	50°00'	145°00'	32.527
13-02.0	50°12'	145°18'	32.636
14-02.0	50°12'	144°48'	32.618
15-02.0	49°48'	144°42'	32.655
16-02.0	50°06'	145°18'	32.698
17-02.0	50°12'	145°00'	32.776
18-02.0	50°12'	145°00'	32.680
19-02.0	50°00'	145°00'	32.668
20-02.0	49°54'	145°00'	32.669
21-02.0	49°54'	145°00'	32.744
23-02.0	49°48'	144°54'	32.663
24-02.0	49°54'	145°00'	32.614
26-02.0	49°42'	145°00'	32.697
28-02.0	50°06'	145°06'	32.812
29-02.0	50°00'	145°12'	32.588

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